

A REVISION OF THE SOUTH AFRICAN AGAMAS ALLIED TO *AGAMA HISPIDA* AND *A. ATRA*.

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(With three Text-figures.)

INTRODUCTION.

No group of South African reptiles stood more in need of revision than the forms of the genus *Agama* that cluster round *A. hispida* and *A. atra*. This has been felt not only by us but by all whose task it has been to name specimens. The account in the British Museum Catalogue of Lizards, based on a very small series of specimens, has long ceased to fulfil its purpose, and the senior author had on various occasions endeavoured to improve the unsatisfactory state of things, but with little success, until we decided to join forces, in order, with the help of a very large material, to arrive at conclusions which would better stand the test of time.

If we have not succeeded in drawing up definitions which will in every case enable the student to determine without hesitation any isolated example that may fall into his hands—although we hope and trust such failures will be rare—we feel sure this is not due to any want of care on our part, but to the state of things in Nature, which precludes such rigid diagnoses as those less versed in the difficulties of systematics expect to find in the writings on which they rely to guide them. It must have occurred to any one of a critical turn of mind, on referring to works of descriptive zoology or botany, that even the best descriptions of the commonest species, when put to the test of a very large material, rarely cover the whole range of individual variation, exceptional deviations from the normal having usually been passed over, and it is clear that the precision of the definitions stands at an inverse ratio to the number of specimens conscientiously examined by the authors. This fault we have endeavoured by every means to avoid, and the result of our attempts from the standpoint of diagnostic rigidity has suffered in consequence. But we must rejoice rather than lament over these difficulties if they bring us nearer to truth. At any rate the work we have undertaken has been for us another lesson in the theory of evolution, and we recommend similar investigations to those who might still entertain doubts as to the derivation of species.

Before proceeding with the exposition of our work and summing up its results, it may be of retrospective interest to show how matters appeared to

stand when we started. The following synopsis has been drawn up by the senior author, from the material then available to him in the British Museum, as a basis for discussion and criticism on the part of his junior, who, though less favourably situated to deal with the historical aspect of the question, enjoyed the superiority of having access to much larger collections,* and was thus in a better position to judge of the constancy of the characters selected for the distinction of species and varieties. It will be seen further on how far this first tentative scheme of classification reflected the true state of things in Nature.

Synopsis of the Species (1916).

- I. Dorso-lateral scales with the keels pointing obliquely inwards (towards the vertebral line); 70 to 115 scales round middle of body.
 - A. Upper parts very rough with enlarged spinose scales; a low crest or serration along the middle of the back, at least indicated by a regular series of strongly keeled scales (exceptionally interrupted); scales on upper surface of tibia unequal in size; fifth toe only exceptionally extending as far as first; tail not compressed, not crested, as a rule shorter than head and body in females.
 Diameter of ear-opening much less than cleft of closed eye; third toe longer than fourth; ventral scales more or less keeled, usually strongly mucronate *A. hispida*, L.
 Diameter of ear-opening much less than cleft of closed eye; third and fourth toes equal, or fourth slightly the longer; ventral scales smooth or feebly keeled *A. brachyura*, Blgr.
 Diameter of ear-opening equal to or a little less than cleft of closed eye; third toe longest (exceptionally third and fourth equal); ventral scales smooth or feebly keeled *A. distanti*, Blgr.
 - B. Upper parts not so rough, the enlarged scales forming more or less regular longitudinal series; a low crest or serration on the middle of the back, as in the preceding; scales on upper surface of tibia equal or nearly so; toes more slender, fifth extending as far as first, third and fourth equal or either slightly the longer; tail not compressed, not crested, longer than head and body in both sexes.
 Head a little longer than broad; ventral scales more or less strongly keeled and mucronate *A. armata*, Peters.
 Head as long as broad; ventral scales smooth or faintly keeled *A. aculeata*, Merr.
 - C. Enlarged dorsal scales few or very irregularly scattered; scales on upper surface of tibia equal; fifth toe extending as far as first, third extending

* The collection in the British Museum contained only 37 specimens in 1885; in 1916, when we started work in collaboration, the number had risen to 232. In addition to these we had at our disposal the collections of the various South African museums, making up a very extensive series. It may be mentioned here that we have tabulated only those specimens which we considered sexually mature. These numbered some 757, but this number by no means represents the vast amount of material that we have examined. We beg to express our grateful thanks to the Directors of the various museums for their kindness in putting the material under their charge at our disposal.

beyond fourth; tail longer than head and body, feebly compressed and crested in the male.

A vertebral crest or regular series of strongly keeled scales on the back; foot much shorter than tibia; ventral scales more or less distinctly keeled *A. anchietae*, Bocage.

No trace of vertebral crest on the back; foot as long as or slightly shorter than tibia; ventral scales smooth *A. methueni*, sp. n.

II. Dorso-lateral scales with the keels pointing obliquely outwards; no dorsal crest; ventral scales smooth; ear-opening large; fifth toe extending as far as first, or farther, third and fourth equal or either slightly the longer; tail longer than head and body, more or less compressed and crested in the male *A. atra*, Daud.

Enlarged dorsal scales usually present but small and few; 105 to 150 scales round middle of body *Forma typica*.

No enlarged dorsal scales; 150 to 160 scales round middle of body
var. *microterolepis*, Blgr.

Scattered strongly keeled and mucronate scales on the back; 170 to 180 scales round middle of body var. *holubi*, Bocage.

Numerous strongly enlarged spinose scales on the back; 90 to 110 scales round middle of body var. *rudis*, n.

As the work of testing and criticizing proceeded it was found that the definitions of divisions I and II of the Synopsis deserved to stand, the direction of the dorso-lateral scales—a character which had not been pointed out before—being readily applicable in all cases. But many of the characters suggested for further subdivision proved to be either utterly worthless, or else subject to such frequent exceptions as to require a complete re-casting of the key. Thus the size of the ear-opening as compared to that of the eye-cleft was found to suffer exceptions amounting to 20 per cent. in *A. distanti*; the degree of slenderness of the toes and the proportions of them varies much more than was supposed, and the same may be said of the scaling on the back, on the tibia, and on the belly.

The following detailed table was constructed to show the amount of variation in specimens from a given locality, collected in this case from the neighbourhood of Kimberley by the junior author.

		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
Kimberley	♂	81	4	3	x	3rd and 4th	x	20	20	21	A	x	x
"	♂	98	4	3	N	4th	x	21	21	23	A	x	x
"	♀	110	4	4	0	3rd	x	22	23	23	D	x	0
"	♀	102	4	3	N	3rd and 4th on left foot, 4th on the right foot	x	21	21	22	D	0	x
"	♂	104	4	4	x	3rd and 4th on right foot, 4th on left foot	0	23	24	24	N	0	x
"	♂	106	5	3	0	3rd and 4th	x	20	23	21	N	0	x
"	♀	93	3.5	3.5	N	3rd	x	20	20	20	D	x	x
"	♀	58	4	4	0	4th	0	22	22	23	D	0	0
"	♂	100	4	4	0	4th	x	22	22	23	N	0	0
"	♂	106	4	3	x	4th	x	24	24	25	A	0	0

EXPLANATION OF TABLE.

1. Length of body from snout to vent (in millimetres). 2. Length of cleft of closed eye. 3. Diameter of ear-opening. 4. Toes (long and slender $\times$; short and thick 0). 5. Longest toe. 6. Fifth toe extending as far as the first $\times$; fifth not extending as far as the first 0. 7. Length of tibia. 8. Length of head. 9. Length of foot. 10. Dorsal scaling (A = like *armata*, D = *distanti*, N = normal). 11. Ventral scaling (keeled $\times$; smooth 0). 12. Scales on upper surface of tibia (equal $\times$; unequal 0).

Yet most of the differences pointed out in the above synopsis are not to be wholly discarded, as they apply to the *ensemble* of the lizards when numbers from one district or locality are brought together, and most of them may still be used, in combination, to define varieties, although each lacking that amount of fixity which would be required to justify specific distinction in the case of *A. brachyura*, *distanti*, *aculeata* and *armata*. It also became evident that the separation of *A. microterolepis* from *A. atra*, even as a variety, could not be upheld.

Before going further it may be well to explain how we understand the conception of species and varieties.

It is the opinion of the senior author that species are natural entities, of which, however, we can only convince ourselves in each case by an appeal to ethology and ontogeny.* He therefore regards the species in the Linnean sense as the real unit of classification. Species may be defined as groups morphologically and physiologically limited and stable at the present day. From the physiological standpoint we need not fear to include under one species forms which show an enormous range of morphological variation. So we regard man, the dog, the horse as each representing one species, although the different forms included under each differ more from each other than do many that have proved to be fully entitled to specific rank. It is a common fallacy to fancy that such enormous variations occur only in domesticated species; many examples of the contrary could be adduced in the case of Reptiles and Batrachians, such as the wall-lizards of Southern Europe, the edible frog, etc. There is no measure for specific characters: in every case we have to consult Nature, rigid rules cannot be laid down.

In the case of the European Batrachian fauna, which has been better studied from the point of view of ethology and ontogeny than any other department of Herpetology, there should be no difficulty in deciding as to

* As opinions still differ on this "physiological sanction" of species we may quote Bateson's latest view (1914): "Whether science will hereafter discover that certain groups can by peculiarities in their genetic physiology be declared to have a prerogative quality, justifying their recognition as species in the old sense, and that the differences of others are of such a subordinate degree that they may in contrast be termed varieties, further genetic research alone can show. I myself anticipate that such a discovery will be made, but I cannot defend the opinion with positive conviction."

what constitutes a species. Thus the forms that cluster round *Rana temporaria*, although so difficult to distinguish that only an expert with considerable experience is able to do so without hesitation, are true species, whilst the forms of *Rana esculenta*, so different from one another that they have been referred to distinct genera by herpetologists of repute, can only be looked upon as varieties.*

It goes without saying that when the cabinet naturalist has to decide on what is a species, his opinion is merely provisional and based on experience derived from better-known forms, absence of connecting links in the material before him, and so on. But it is a safe rule not to accord the rank of species to forms that cannot be rigidly diagnosed; it is better, in the interest of science, not to overburden the system with specific names when we can have recourse to the simple method of registering forms of doubtful rank as varieties, often called subspecies.

The objection to the term *subspecies*, and as a consequence trinomial nomenclature, is this: that it is an absolutely unnecessary departure from the system established by Linnaeus, and that it ultimately results in such barbarisms as *Martes martes martes*, *Pica pica pica*, *Bufo bufo bufo*, etc., which find favour with so many among the latest systematists. The term "subspecies" dates back about 65 years. It was first introduced in zoology by the ornithologist Ludwig Brehm (1855), in botany by Hewitt Watson (1859). It is practically synonymous with the *variety* of Linnaeus. "Variety" has often been used in a loose sense, or to express various forms of variation, individual departures not sufficiently fixed, except by human artifice, and Latin names should not be bestowed on them save for the convenience of breeders and horticulturists. Linnaeus designated the varieties which he recognised by the letters of the Greek alphabet. He made a distinction between those forms which he regarded as derived from the species and those which, in his opinion, constituted *ex æquo* the concept of the species. For the former he began the series of varieties by the letter β , the *forma typica* being designated under the binomial, to the definition of which the varieties were simply tacked on; for the latter the specific diagnosis embraced the characters common to all the forms, and the varieties, being regarded as equivalent components of the species, were lettered α , β , γ , etc. He thus distinguished between derivative varieties and varieties constituting

* "Any herpetologist having before him the Japanese and Spanish frogs (*R. esculenta*), without any knowledge of the intermediate forms, would unhesitatingly pronounce them as representing distinct species. But if we pursue our investigations over the whole area occupied by this frog, viz. the whole of the Palaearctic region, we soon find all the differences by which we were at first struck to blend through such a number of intermediate forms as to leave no other course open but to maintain intact the Linnean species" (Boulenger, P. Z. S., 1891, p. 394). These remarks apply equally well to the Agamas now grouped under *A. hispida*,

together *collective species*. The plan followed by the senior author is to bestow the term *forma typica* on the earliest-described form of these "collective species," and that of *varietates* on those described later—a necessary concession to the rule of priority in nomenclature, which does not affect the philosophical side of the question, since it is mitigated by the practice of placing the typical form not necessarily at the head of the series, but in any position which expresses the relationship. Thus the forms of *Rana esculenta* are arranged in the following order*:

1. *Rana esculenta*, var. *ridibunda*, Pall.
2. " " var. *saharica*, Blgr.
3. " " *f. typica*.
4. " " var. *lessonae*, Camer.
5. " " var. *chinensis*, Osb.

In the case of *Agama hispida* the typical form would appear last on the list.

The general practice among systematists is to call subspecies or varieties forms which, however distinct, are known to intergrade. Intergrading is of two kinds:

It may be associated with the known joining of the two respective habitats, intermediate specimens inhabiting intermediate districts. Or the two habitats do not join, but an examination of a series of specimens will show an intergradation of characters; the forms are not strictly geographical.

Then, other systematists accord only subspecific rank to forms which, though not actually intergrading, differ too slightly from the type to be regarded as species; they do this, to some extent, on the assumption that, though not known to intergrade, they will be found to do so when larger series are examined. The describer's knowledge of the group to which the animal or plant belongs justifies him in anticipating the evidence of actual intergradation.

Several modern authors wish to restrict the subspecies to geographical forms. Any ever so slight deviation from the normal, if associated with a distinct habitat, becomes a subspecific form, for which the term *forma vicaria* has also been proposed. It seems, however, that it is just in such cases that the adjunction of a third name is least wanted, as the indication of the locality after the name of the species is amply sufficient to avoid confusion.

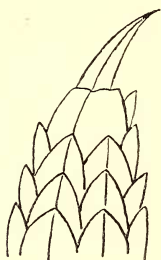
A considerable degree of differentiation is needed to justify even a varietal name, and we should be careful not to overburden nomenclature with Latin names; but when once it is ascertained that strong modifications affect a large proportion of the individuals from a given district, it is advisable to express the fact by a name, all the more if the individuals in

* Cf. Boulenger, Ann. Mag. N.H. (9), ii, 1918, p. 241.

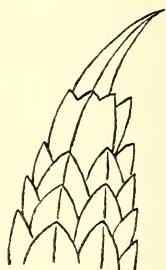
South African Agamas allied to Agama hispida and A. atra.

As mentioned on the opposite page, we have arranged the species and varieties, as we now understand them, into three main groups which seem to express their natural affinities.

The three groups to which we allude are based on the direction of the dorso-lateral scales, inwards in I and II, outwards in III; and on the condition of the toes, as shown by the following figures:



GROUP I.



GROUPS II AND III.

In Group I the terminal dorsal scale of the third or fourth toe is not, or at most little, longer than the penultimate, and the ventral series, on the same toe, varying from 12 to 20 in number, rarely show black or dark-brown pigment at the end of the spinose keels. In Groups II and III the terminal dorsal scale is larger and the keels on the subdigital scales, 13 to 22 in number, are usually tipped with dark brown or black.

question are not strictly geographical forms, and as from the fact that the characters on which the varieties are based are not constant, it will be optional to use the varietal name when it is required for the purpose of greater precision, or to drop it when the intermingling of forms is so complete as to render the distinction impracticable and hence worse than useless. And so we have dealt with the variation of *Agama hispida* in the wide sense, this lizard affording an excellent example of what we understand by the term "variety" as opposed to "species," and also of the difficulties with which the systematist is confronted in the case of polymorphic species.

There is also the question to consider whether the different varieties when they meet in one district do not cross, and thus give rise to individuals which further add to the perplexity of the student. It is, indeed, highly probable that such hybrids, or rather mongrels, do occur in the Agamas, but we have no means of satisfying ourselves that they are such, and it would be unscientific to get over the difficulties by suggestions which do not rest on any observed fact.

After long study, extending over three years, and embracing a very large material, we have agreed to divide the group of Agamas of which we undertook the revision into three species only: *A. hispida*, L., *A. anchietae*, Bocage, and *A. atra*, Daud., each of which includes a number of forms which cannot be defined with sufficient precision to justify specific rank, and which we therefore call varieties.

Synopsis of the Species.

- I. Terminal dorsal scale on the third or fourth toe not, or but little, longer than the penultimate; dorso-lateral scales with the keels pointing obliquely inwards (towards the vertebral line) . . . 1. *A. hispida*, L.
- II. Terminal dorsal scale on the third or fourth toe much longer than the penultimate; dorso-lateral scales with the keels pointing obliquely inwards 2. *A. anchietae*, Bocage
- III. Terminal dorsal scale on the third or fourth toe much longer than the penultimate; dorso-lateral scales with the keels pointing obliquely outwards 3. *A. atra*, Daud.

It will be noticed that the characters on which the definition of the species now rests are just such as have entirely escaped attention on the part of previous writers.

A. hispida.—Five forms: *f. typica*, vars. *armata*, Peters, *aculeata*, Merr, *distanti*, Blgr., *brachyura*, Blgr.

A. anchietae.—Three forms: *f. typica*, var. *methueni*, Blgr. & Power, var. *n. knobeli*, Blgr. & Power.

A. atra.—Three forms: *f. typica*, var. *holubi*, Bocage, var. *rudis*, Blgr. & Power.

After each of these forms had been described from the limited material

at the disposal of the senior author, the specimens in various South African museums have been critically alluded to by the junior author, who is alone responsible for their identification.

1. AGAMA HISPIDA, L.

A. *Forma typica.*

Lacerta hispida, Linn. Mus. Ad. Fred. p. 44 (1754), and Syst. Nat. (ed. 10) i, p. 205 (1755).

Agama spinosa (non Gray), Dum. & Bibr. Erp. Gén. iv, p. 502 (1837).

Agama hispida, Bouleng. Cat. Liz. i, p. 349 (1885).

The type of this species is not in existence.* There can, however, be no doubt as to the correct application of the name *hispida*, which was based by Linnaeus on figures in Seba's Thesaurus, vol. i :

P. 134, pl. 83, figs. 1, 2. *Lacertus, orbicularis, spinosus, sive Tapayazin*, ex Nova Hispania. Hernandez, ix.

P. 173, pl. 109, fig. 6. *Bufo americanus, spinosus, Tapayazin*.

Now, these quotations from Hernandez refer to a totally different lizard from Mexico, which bears the name *Phrynosoma orbiculare*, L. The figures given by Seba represent a stout *Agama*, no doubt from the Cape, like the other South African reptiles known in those early days, and the ventral aspect, in pl. 83, fig. 2, shows a dark, wide-meshed network on the body. *Lacerta hispida* is therefore the *Agama* which occurs in the neighbourhood of Cape Town. The following description is taken from specimens, preserved in the British Museum, which may be regarded as typical of that species.

Form.—Habit very stout, body much depressed. Head short, convex, subcordiform, its width equal to or greater than its length to occiput; snout very short, rounded; canthus rostralis very short; nostril directed outwards, in a convex but not tubular shield, which, exceptionally, may be nearly flat, pierced below the canthus rostralis; length of head 4 (male) to $4\frac{1}{2}$ (female) times in length to vent. Diameter of ear-opening much less ($\frac{1}{2}$ to $\frac{3}{4}$) than cleft of closed eye. Limbs moderately elongate; the hind limb, pressed against the body, reaches the shoulder or the neck; length of hand equal to depth of head; fingers short, third longest; tibia or crus as long as or a little shorter than the head or the foot; toes short, third longer than fourth, fifth not extending as far as the first, than which it is not or but slightly longer. Tail cylindrical, rather slender, a little longer or a little shorter than head and body ($\frac{9}{7}$ to $1\frac{1}{3}$ times in males, $\frac{3}{4}$ to $1\frac{1}{10}$ times in females).

Measurements (in millimetres) :

* Cf. Andersson, Bih. Sv. Vet.-Ak. Handl., xxvi, iv, 1, 1900, p. 11.

	1.	2.	3.	4.
From snout to vent	88	67	100	92
Head (to occiput)	23	16	24	22
Width of head	24	18	24	23
Depth of head	16	12	16	15
Diameter of eye-cleft (eye closed)	4	3.5	5	5
„ „ ear-opening	2.5	2.5	2.5	2.5
Fore limb	47	33	44	42
Hand	16	12	15	15
Hind limb	60	43	59	56
Tibia	21	15	22	19
Foot	24	17	22	20
Tail	94	63	105	77

1. ♂, Cape of Good Hope (Busk). 2. ♂, Cape of Good Hope (Lea).
 3. ♀, Cape Colony (Haslar Hosp.). 4. ♀, Eerste River (Leighton).

Lepidosis.—Upper parts very rough, with enlarged spinose scales on the posterior part of the head and on the body and limbs, scattered, or forming small groups among moderately large, imbricate, strongly keeled and sometimes more or less distinctly mucronate scales; 70 to 85 scales round middle of body; the longest spinose scales near the ear-opening as long as or a little longer than the diameter of the latter; a vertebral series of more or less distinctly enlarged scales, often forming a low but very distinct nuchal and dorsal crest, which may be interrupted on the back. Upper head-scales unequal, rough, keeled or subconical, one or two enlarged, usually one trihedral, in the middle of the forehead; occipital* enlarged, the pineal foramen in a crater-like pit, and surrounded by conical spinose scales; 9 to 13 scales across the head, from one superciliary edge to the other; 12 to 16 upper labials on each side; 2 to 4 series of scales between the upper labials and the nasal. Gular and ventral scales keeled, usually strongly, more or less mucronate, usually very strongly. Scale at the base of the claw, on the dorsal surface of the toes, uni- or tricarinate, and not or but little longer than the others; subdigital scales spinose, 12 to 16 in a longitudinal series under the third toe. Caudal scales strongly keeled and more or less distinctly mucronate, not forming whorls, equal except at the base, where their character partakes of that of the body. Male with a single row, exceptionally two rows† of rather small, sometimes very indistinct preanal pores.

* Representing the interparietal of other lizards. Following the example of previous authors, and for convenience, we have used the term "occipital" for this scale, although it is not homologous with that so-called in *Lacerta*.

† As noticed by Duméril and Bibron.

*Coloration.**—Brown, light grey, olive, or vivid green above; males with rather indistinct darker and lighter variegations; females, and some males, with two or four longitudinal and four or five transverse series of squarish dark brown, dark green, purplish, or blackish spots or cross-bars on the body, usually with a Λ -shaped yellowish marking between the spots, on the vertebral line; also with dark cross-bars on the limbs and tail. Lower parts bluish grey or greenish blue in males, darker on the throat; yellowish or greyish white in females and young, often with a wide-meshed dark grey or black network on the belly.

Particulars of Specimens Examined.†

	1.	2.	3.	4.	5.	6.	7.	8.	9.
BRITISH MUSEUM:									
Cape of G.H. (Busk) ♂	88	94	23	60	21	24	4	2.5	3rd
" (Townsend) ♂	73	74	19	48	17	19	4	2.5	3rd
" (Lea) ♂	67	63	18	43	15	17	3.5	2.5	3rd
" (Belcher) ♀	90	?	21	57	20	20	4	2	3rd
Eerste R. (Leighton) ♀	92	77	21	56	19	20	5	2.5	3rd
Cape Colony (Chatham Mus.) ♀	100	105	24	60	22	22	5	2.5	3rd
" (") ♀	89	100	22	56	20	21	4	3	3rd
Little Namaqualand ♂	80	88	22	52	20	20	4	2.5	3rd
SOUTH AFRICAN MUSEUM:									
Claremont ♂	84	105	21	53	20	21	?	2	3rd
" ♂	80	83	20	54	19	20	4	2	3rd
Cape Flats ♂	98	117	23	62	22	24	4	2	3rd
" ♀	98	76	21	53	20	19	5	2	3rd
" ♀	85	76	20	53	19	20	4	2	3rd
Calvinia ♀	98	90	22	54	19	20	4	2	3rd
Hondeklipbay ♂	89	99	20	54	21	22	4	2	3rd
KIMBERLEY MUSEUM:									
Somerset Strand ♂	85	102	20	55	19	20	3.5	2	3rd
" ♂	79	88	20	50	16	19	4	1.5	3rd
" ♂	70	80	17	45	16	18	3	1.5	3rd
" ♀	83	6	17	46	16	19	3.5	2	3rd

* Owing to variability and power of colour-change possessed by the Agamas, as pointed out in the South African Journal of Science, 1917, p. 263, it is not possible to give adequate descriptions of the coloration. We have therefore limited ourselves to some general statements, which, we trust, may be found helpful for the purpose of identification.

† The nine columns read as follows in this as well as the other tables: 1. Length (in millimetres) from snout to vent. 2. Tail. 3. Head (to occiput). 4. Hind limb. 5. Tibia (from heel to knee). 6. Foot (including claw). 7. Length of cleft of closed eye. 8. Greatest diameter of ear-opening. 9. Longest toe. The localities are given according to latitude, beginning with the most southerly.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
ALBANY MUSEUM:									
Tulbagh ♂	86	107	20	56	20	21	3.5	2	3rd
„ ♂	72	80	17	47	17	18	3.5	2	3rd
„ ♀	76	73	17	49	17	19	3	2	3rd
„ ♀	70	63	16	45	17	18	3.5	2	3rd
TRANSVAAL MUSEUM:									
Cape of Good Hope ♀	87	96	19	47	17	18	3.5	2	3rd
Tulbagh ♀	66	61	15	43	15	15	3.5	1.5	3rd

Habitat.—The South-Western part of the Cape Colony.

This *Agama* seems to inhabit, generally speaking, undulating sandy country. It is found among the sand-dunes on the Cape Flats, and the junior author has collected specimens on the grassy slopes of the hills behind Somerset West village. One specimen was captured on the roadside.

The food consists of plants and insects.

B. Var. BRACHYURA.

Agama brachyura, Bouleng. Cat. Liz. i, p. 350, pl. xxviii, fig. 1 (1885); and Proc. Zool. Soc. 1905, ii, p. 252.

This form, originally considered a species, was founded on a single specimen in the British Museum, a female without indication of locality but forming part of Sir Andrew Smith's South African Collection. The British Museum has since received specimens from Deelfontein, Klipfontein and Little Namaqualand which agree very closely with the type, and which unquestionably pertain to the same form in the narrowest sense. It is on this small material that the following description is based; but a larger series shows the characters to be inadequate for a sharp separation of this supposed species from *A. hispida*, and we have accordingly reduced its rank to that of a variety. The following description is taken from the specimens in the British Museum:

Form.—Habit very stout, body much depressed. Head short, convex, subcordiform, its width equal to or greater than its length to occiput; snout very short, rounded; canthus rostralis very short; nostril directed outwards and upwards, in the upper part of a convex but not tubular shield, pierced on or just below the canthus rostralis; length of head $3\frac{1}{2}$ to 4 times in length to vent. Diameter of ear-opening less ($\frac{1}{2}$ to $\frac{3}{4}$) than cleft of closed eye. Limbs moderately elongate; the hind limb reaches the shoulder or the neck, or merely the ear; length of hand equal to or greater than depth of head; fingers short, third longest; tibia as long as or a little longer than head or foot; toes short, fourth longer than third, or third and fourth equal, fifth not extending as far as first. Tail cylindrical, moderately or

very slender, a little longer or a little shorter ($\frac{5}{6}$ to $1\frac{1}{2}$ times) than head and body.

Measurements (in millimetres):

	1.	2.	3.	4.
From snout to vent	111	92	83	71
Head	27	23	21	19
Width of head	27	23	21	20
Depth of head	17	16	14	12
Diameter of eye-cleft	5	4.5	4	4
„ „ ear-opening	3	2.5	2.5	2.5
Fore limb	54	49	42	37
Hand	19	16	15	14
Hind limb	73	62	55	51
Tibia	27	21	20	18
Foot	27	23	21	20
Tail	129	82	90	63

1. ♂, Little Namaqualand. 2. ♀, Little Namaqualand. 3. ♂, Deelfontein. 4. ♀, S. Africa (type).

Lepidosia.—Upper parts rough with enlarged spinose scales as in *A. hispida*, but not so plentiful, more as in an average *A. aculeata*, the smaller scales strongly keeled and mostly mucronate; the largest spinose scales forming 3 or 4 longitudinal series on each side of the back; 80 to 90 scales round middle of body; the largest spinose scales near the ear-opening as long as or a little shorter than the diameter of the latter (shorter in the young); vertebral crest very low but distinct on the nape, just indicated or interrupted on the back. Upper head-scales unequal, rough, keeled or subconical, sometimes smooth on the snout and over the eyes, a few enlarged in the middle of the snout; some enlarged trihedral scales just behind or partly surrounding the enlarged occipital; the pineal foramen in the centre of a pit which may be shallow or deep and crater-like as in *A. hispida*; 11 to 15 scales across the head, from one superciliary series to the other; 11 to 15 upper labials on each side; 3 to 5 series of scales between the upper labials and the nasals. Gular and ventral scales smooth or faintly keeled, sometimes shortly mucronate. Scale at the base of the claw, on the dorsal surface of the toes, uni- or tricarinate and not, or but little, longer than the others; subdigital scales spinose, 14 to 18 in a longitudinal series under the third or fourth toe. Caudal scales strongly keeled, more or less distinctly mucronate, not forming whorls, equal except at the base. Scales on upper surface of tibia very unequal in size.

Male with a single row of rather small preanal pores.

Coloration.—Yellowish or greyish brown above, large males greenish olive, females sometimes reddish brown, with two or four longitudinal and

four or five transverse series of dark brown or blackish spots on the body, with an oval, square, Λ - or χ -shaped light marking between the spots on the vertebral line. Limbs and tail with dark cross-bars. Lower parts yellowish white, pale olive in full-grown males, with a more or less distinct wide-meshed grey or dark olive network; throat of males blackish or bluish-green.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
BRITISH MUSEUM:									
S. Africa (type) ♀	71	63	19	51	18	20	4	2.5	4th
Deelfontein ♂	83	90	21	55	20	21	4	2.5	3rd & 4th
" ♀	86	77	21	55	20	22	4	2.5	3rd & 4th
" ♀	59	54	18	43	15	18	3.5	2	4th
Port Nolloth ♂	110	130	27	72	27	27	5	3	3rd & 4th
Little Namaqualand ♂	111	129	27	73	27	27	5	3	3rd & 4th
" ♀	92	82	23	62	21	23	4.5	3	4th
Klipfontein ♂	100	107	27	71	25	27	5	3	4th
" ♀	67	55	18	44	16	17	4	2	4th
" ♀	64	64	16	46	16	18	3.5	2	4th
SOUTH AFRICAN MUSEUM:									
Worcester ♂	91	111	21	66	24	25	4	2.5	4th slightly
Nelspoort, Beaufort W. ♀	79	72	17	48	17	17	3.5	2	3rd & 4th
Calvinia ♀	103	85	21	63	23	23	4	1.5	4th
Springbok, Steinkopf ♂	93	110	21	63	21	24.5	4.5	2.5	4th
Port Nolloth ♂	98	110	21	71	24	27	4	2.5	4th
" ♂	121	146	26	77	27	28	6	3.5	4th
" ♂	95	111	23	64	22	24	4	3	4th
" ♀	99	93	21	59	21	22	4	2.5	4th
" ♀	81	95	19	60	21	22	?	2	3rd & 4th
" ♂	97	111	22	62	22	24	4	3	3rd
" ♂	111	127	25	64	26	23	5	3	4th
" ♂	109	123	28	65	25	27	5	3	3rd
" ♀	89	83	21	59	21	22	4	2	3rd
Ograbis ♂	99	123	22	69	24	25	?	3	4th
Aninus ♀	101	72	21	61	22	22	4	3	3rd & 4th
Grassmund, Little Namaqua-									
land ♀	113	93	24	66	23	23	4.5	3	4th
" ♀	115	?	25	70	25	25	5	2.5	3rd & 4th
Aus ♀	101	96	20	66	22	24	4	2	4th
KIMBERLEY MUSEUM:									
Driekoppen ♀	72	85	18	47	17	18	3	2	4th
" ♀	76	73	17	48	18	17	4	3	3rd
Kuboos ♂	108	122	26	69	27	25	5	2.5	4th
Aus ♂	105	?	31	73	26	28	5	2.5	4th
" ♀	95	85	28	60	21	25	4	2	4th
" ♂	104	?	23	72	25	27	5	2.5	4th
" ♀	96	83	21	60	22	23	5	2.5	4th

	1.	2.	3.	4.	5.	6.	7.	8.	9.
ALBANY MUSEUM:									
Steinkopf ♂	113	126	25	72	26	25	4.5	3	4th slightly
" ♀	102	88	19	62	22	23	4.5	3	4th

The following disagreements with the above description are to be noted ;

1. The enlarged dorsal scales sometimes arranged in clusters at either side of the vertebral line.—Aus, Pt. Nolloth, Steinkopf, Nelspoort.

2. Enlarged scales scattered irregularly and few.—Pt. Nolloth.

3. Smaller dorso-laterals strongly keeled but not mucronate.—Aus, Kuboos, Pt. Nolloth.

4. A female from Aus has the smaller dorsals strongly keeled but not mucronate ; ventrals strongly keeled and mucronate ; head-scales smooth over the eyes and on the forehead.

5. A male from Namaqualand resembles this specimen, but the enlarged dorsals in this case are only slightly enlarged, and arranged in 3 longitudinal series on either side.

6. A female from Namaqualand has the enlarged dorsal scales in clusters ; the third toe longest on the right foot, the fourth on the left.

7. Four enlarged scales in the middle of the snout.—Pt. Nolloth, Ograbis, Nelspoort, Grassmund.

8. Preanal pores apparently entirely absent.—Beaufort West, Steinkopf.

9. Preanal pores in two rows.—Pt. Nolloth.

10. The third toe longest on the right foot, the fourth on the left.—Aus, Pt. Nolloth.

11. The third toe longest.—Pt. Nolloth (3 specimens), Driekoppen (1 specimen). Otherwise agreeing with *A. brachyura*.

12. Toes long and slender.—Nelspoort.

13. Specimens from the farm "Driekoppen," Hanover Division, show a decided passage from *A. brachyura* to *A. distanti*. It is most difficult to place some of the specimens, as they exhibit the characters of both species in almost every possible combination.

One specimen has the ear-opening small as in typical *A. brachyura*, scaling rougher than in specimens of *A. distanti* from Pretoria, but the third toe longest ; another has all the above characters but the fourth toe longest ; while yet another has the ear-opening 3 mm. on one side, 2 mm. on the other, and the third and fourth toes equal.

A male from Namaqualand, and a female, probably from the neighbourhood of Pt. Nolloth, are very like *A. aculeata* but that the ear-opening is small and the toes are exceptionally long and slender. There are usually 3 or 4 enlarged, trihedral scales on the forehead with some smaller ones at either side, just behind and partly surrounding the occipital scale, which is usually slightly pitted.

Material from Nelspoort and Beaufort West may have the enlarged

dorsal scales arranged in clusters; upper head scales not so strongly keeled as usual; 4 enlarged trihedral scales on the forehead; occipital scale slightly pitted; ventrals perfectly smooth throughout; toes rather long and slender.

The lesser length of the third toe compared with the fourth has been regarded as the principal character for separating *A. brachyura* from *A. hispida*. However, the case above noted, of the third toe being the longer on the right foot and the fourth on the left, shakes our faith in its value, and we have in consequence referred to *A. brachyura* those specimens from Pt. Nolloth (South African Museum) which differ from others obtained in the same locality in no other important point. All we can say is that in the south-west parts of the Cape Province a rougher lepidosis coupled with a longer third toe (typical *A. hispida*) prevails. The more northern form may perhaps be maintained as distinct under the name of var. *brachyura*.

Agama hispida, var. *brachyura*, seems to inhabit arid regions, and is found at Aus in rocky localities. According to Capt. J. B. Knobel the neighbourhood of Aus is very rugged, but at some distance from it there is a good deal of grass veld, and at intervals some wind-blown sand. The country is bleak and bare except in the hollows, where the rain-water settles and enables a few trees to grow.

This variety is also found in the Karroo.

C. VAR. *DISTANTI*.

Agama distanti, Bouleng. Ann. & Mag. N. H. (7) ix, 1902, p. 339.

The distinction of this form from *A. hispida* was originally based on specimens from Pretoria and Rustenburg, Transvaal, preserved in the British Museum. The following description is drawn up exclusively from these type specimens.

Form.—Habit very stout, body much depressed. Head short, convex, cordiform, its width equal to its length to occiput or slightly greater; snout very short, rounded; canthus rostralis very short; nostril directed outwards or outwards and upwards, in a convex but not tubular shield, pierced on or just below the canthus rostralis; length of head $3\frac{1}{3}$ to $4\frac{1}{5}$ times in length to vent. Diameter of ear-opening equal to or slightly greater than length of cleft of closed eye. Limbs moderately elongate; the hind limb, pressed against the body, reaches the shoulder or the neck (or the ear in young); length of hand equal to or a little less than depth of head; fingers short, third longest; tibia shorter than the head, as long as or slightly shorter than the foot; toes short, third longer than fourth, fifth not extending as far as first. Tail cylindrical, moderately or very slender, a little longer or shorter than head and body ($\frac{3}{4}$ to $1\frac{1}{4}$).

Measurements of type specimens, in millimetres:

	1.	2.	3.	4.
Snout to vent	82	80	83	75
Head	21	19	20	18
Width of head	21	20	20	18
Depth of head	14	12	13	12
Diameter of eye-cleft . .	4	3.5	3.5	3.5
„ „ ear-opening . . .	4	3.5	4	3.5
Fore limb	34	31	36	34
Hand	12	11	13	12
Hind limb	49	45	48	44
Tibia	17	16	17	15
Foot	17	16	17	16
Tail	100	77	62	59

1. ♂, Pretoria. 2. ♂, Rustenburg. 3, 4. ♀, Pretoria.

Lepidosia.—Upper parts rough with enlarged spinose scales as in *A. hispida*, but often not so strongly, the smaller scales very small, strongly keeled but not mucronate (except low down on the sides); 85 to 110 scales round the middle of the body*; some of the spinose scales may form longitudinal series on the back; the largest spinose scales near the ear-opening shorter than the diameter of the latter; vertebral crest very low but distinct on the nape, just indicated or absent on the back. Upper head-scales unequal, and more or less strongly keeled, 3 to 5 enlarged in the middle of the snout; occipital enlarged; 12 to 16 scales across the head from one superciliary series to the other; 11 to 16 upper labials on each side; 2 to 4 series of scales between the upper labials and the nasal. Gular and ventral scales smooth or faintly keeled, not or but very shortly mucronate, except on the sides. Upper scale at base of claw not or but slightly longer than the others; 12 to 15 scales in a longitudinal series under the third toe. Caudal scales strongly keeled, feebly mucronate, not forming whorls, equal except at the base, where their character partakes of that of the body. Scales on upper surface of tibia very unequal in size. Male with a single row of rather small preanal pores.

Coloration.—Greyish olive or brown above, with a yellow vertebral stripe from the occiput to the tail, where it merges into the pale colour of that organ; this vertebral stripe may be incompletely divided by an interrupted dark line along the median series of scales; back uniform (females) or with large squarish dark brown spots forming a series on each side of the vertebral stripe; upper surface of head with symmetrical dark and light markings, in the form of bars or chevrons between the eyes; head sometimes blackish above (female from Pretoria); limbs and tail with dark cross-bars. Lower

* The range of variation for all the specimens in the British Museum is 85 to 115.

parts white, throat with blueish or blackish wavy longitudinal lines or vermiculations.

We have now examined many more specimens, enumerated hereafter, some of which disagree with the types in important respects :

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
BRITISH MUSEUM :									
Pretoria (type) ♂	82	94	21	49	17	18	4	4	3rd
" " ♂	77	89	21	52	19	20	4	4	3rd
" " ♂	66	?	16	50	17	18	3	3	3rd
" " ♂	54	65	16	37	14	15	3	3	3rd
" " ♂	53	60	16	39	13	15	3	3	3rd
" " ♂	49	49	15	34	12	14	2.5	2.5	3rd
" " ♀	83	62	20	48	17	17	3.5	4	3rd
" " ♀	75	59	18	44	15	16	3.5	3.5	3rd
" " ♀	62	67	16	42	14	18	3.5	3.5	3rd
Rustenburg (type) ♂	80	77	19	45	16	16	3.5	3.5	3rd
" " ♀	60	61	17	41	14	15	3	3	3rd
Barberton, Transvaal ♂	84	110	22	49	19	19	4	4	3rd
" " ♂	79	100	20	46	16	17	4	4	3rd
Wolmeransted-Bloemhoff, Trans-									
vaal ♂	69	?	17	46	16	17	4	4	3rd
Zoutpanberg, Transvaal ♀	66	82	18	46	16	17	3	3	3rd
" " ♀	57	65	16	40	15	16	2.5	2.5	3rd
Woodbush, ♂	61	90	18	43	14	16	3	3	3rd
Tweespruit, O.F.S. ♂	55	55	17	40	14	15	3	3	3rd
" " ♀	80	67	22	49	18	19	4	4	3rd
Vredefort Rd., O.F.S. ♂	75	81	19	52	19	20	3.5	3.5	3rd
" " ♂	73	83	19	57	20	20	3.5	3.5	3rd
" " ♂	70	76	18	46	16	17	3	3	3rd
" " ♂	69	?	18	48	18	18	3	3	3rd
" " ♂	60	60	16	43	15	16	2.5	2.5	3rd
" " ♀	81	70	19	53	19	20	3	3	3rd
" " ♀	77	68	19	52	18	19	3	3	3rd
" " ♀	76	63	19	52	19	20	3.5	3	3rd
" " ♀	71	61	18	45	17	17	3.5	3	3rd
Bulawayo ♂	90	130	23	57	20	21	4	4	3rd
" ♂	88	122	22	52	19	19	4	4	3rd
" ♂	80	116	19	54	19	20	4	4	3rd
" ♂	70	89	18	44	15	16	3	3	3rd
" ♀	90	90	22	51	19	19	4	4	3rd
" ♀	73	70	18	40	15	16	3	3	3rd & 4th
" ♀	85	85	22	50	17	19	4	4	3rd
Mazoi, Mashonaland ♂	68	86	18	43	15	16	3	3	3rd
" " ♂	59	?	16	41	14	15	3	3	3rd
" " ♂	50	58	15	35	12	14	2.5	2.5	3rd & 4th
" " ♀	49	55	14	35	12	14	2.5	2.5	3rd

	1.	2.	3.	4.	5.	6.	7.	8.	9.
TRANSVAAL MUSEUM :									
Potchefstroom ♀	70	60	17	44	16	15	3·5	2·5	3rd
" ♂	73	78	18	47	17	17	3·5	2	3rd
" ♀	83	?	18	48	18	17	3	3	3rd
" ♂	78	85	18	51	19	18	3	2·5	3rd
Meintjes Kop ♀	74	53	16	40	14	14	3	2·5	3rd
Woodbush ♀	80	58	18	41	18	18	3	3	3rd
Pretoria ♀	78	64	16	43	15	16	3	3	3rd
Woodbush ♀	77	66	23	42	14	16	3	2	3rd
Pretoria ♂	70	78·5	16	48	17	18	3	3	3rd
" ♂	79	97	17	45	16	17	3	2	3rd
" ♀	68	56	16	41	14	16	?	2	3rd
Silverton ♂	80	88	18	48	16	18	3	3	3rd
Meintjes Kop ♀	69	56	15	43	15	16	3	3	3rd
Pretoria ♀	70	64	17	44	15	16	3	2	3rd & 4th
Meintjes Kop ♂	75	82	17	49	15	19	3	3	3rd
Pretoria ♀	73	59	15	45	16	16	3	2	3rd
" ♂	79	?	17	46	16	17	3	3	3rd & 4th
" ♂	74	80	17	47	16	17	3·5	3	3rd
" ♀	79	57	17	47	15·5	17	3	3	3rd
" ♀	72	63	16	46	14	17	3	3	3rd
" ♂	84	87	19	49	17	18	3	3	3rd
" ♂	75	87	16	48	16	18	3	2·5	3rd
" ♂	76	91	17	49	15	18	3	2·5	3rd
" ♂	83	88	19	54	17	20	3	3	3rd
" ♂	80	104	19	51	16	20	3·5	3·5	3rd
Woodbush ♀	78	65	18	40	14	15	3·5	2·5	3rd
Meintjes Kop ♂	70	83	16	45	14	16	3·5	3	3rd
Pretoria ♀	74	64	17	45	14	17	3	3	3rd
" ♀	77	64	16	43	14	16	3	3	3rd
" ♀	76	61	16	45	14	17	3	3	3rd
Wonderboom ♀	79	?	16	43	13	16	3	3	3rd
Hornsnek ♀	73	62	17	49	15	18	3	3	3rd
Pretoria ♀	88	62	23	47	15	17	3	3	3rd
" ♀	78	65	17	47	15	18	3	3	3rd
" ♂	66	77	15	42	14	17	3	2	3rd
" ♀	75	76	17	42	13	16	3	2	3rd
Woodbush ♀	75	63	16	40	12	16	3	2	3rd
Pretoria ♂	70	73·5	17	49	18	18	3	3	3rd
" ♂	70	78	15	44	16	16	3	2·5	3rd
" ♀	70	65	16	43	15	16	2·5	2·5	3rd
Goedgedacht ♂	75	94	17	46	14	17	3·5	3	3rd
Witpoort ♀	76	61	17	46	15	17	3·5	3·5	3rd
" ♀	87	63	19	47	15	16	3	2	3rd
Zandfontein ♂	75	84	18	47	17	17	3	3	3rd
" ♀	85	79	20	48	16	17	4	3	3rd
" ♀	79	74	17	48	15	17	3	3	3rd
" ♂	69	85	16	46	14	18	3	3	3rd
Quaggaspoort ♀	62	50	15	39	13	14	3	3	3rd

	1.	2.	3.	4.	5.	6.	7.	8.	9.
Magaliesberg ♂	78	88	17	45	16	17	3	2	3rd
„ ♂	62	71	20	43	14	16	3	2	3rd
„ ♂	65	70	15	41	15	15	3	2	3rd
Kaalplaats ♂	78	?	17	48	16	17	3.5	2.5	3rd
Zoutpan ♂	78	104	18	48	15	19	3.5	3	3rd
„ ♀	75	61	15	40	13	17	3	3	3rd
Rosslyn ♂	80	97	19	49	15	18	3	3	3rd
Vygeboompoort ♂	65	94	17	44	14	16	3	2.5	3rd
„ ♂	65	80	15	44	14	16	3.5	2.5	3rd
„ ♂	76	99	17	46	15	18	3	3	3rd
„ ♂	69	102	16	43	14	16	3.5	3	3rd & 4th
„ ♂	68	81	16	44	14	16	3	3	3rd
„ ♀	66	69	16	41	15	17	3	3	3rd
„ ♀	59	56	15	38	13	16	3	3	3rd
„ ♂	66	80	15	44	15	17	3	3	3rd
Waterberg ♂	75	105	22	45	15	17	3.5	3	3rd
„ ♂	67	88	20	44	15	17	3	3	3rd
„ ♂	76	105	17	43	15	17	3	2.5	3rd
Lydenburg ♀	80	58	17	45	14	16	3.5	3.5	3rd
Metlepetsi River ♂	79	101	18	46	15	19	3.5	2	3rd & 4th
Pietersburg ♂	64	74	16	44	14	17	3	2	3rd
Selati River ♀	98	83	20	47	15	18	3.5	3	3rd
„ ♂	65	78	16	45	14	17	3	2.5	3rd
Zand River ♀	75	75	17	47	15	17	3	2.5	3rd
„ ♀	65	66	16	42	15	16	3	3	3rd
Bandolier Kop ♂	89	?	20	48	18	18	3.5	3	3rd
Transvaal ♀	81	70	19	45	14.5	17	4	3	3rd
„ ♀	76	?	18	46	15	16	3	3	3rd
KIMBERLEY MUSEUM:									
Driekoppen ♀	76	74	17	49	18	18	3.5	2.5	3rd
Bloemfontein ♂	60	?	19	44	15	17	3	2	3rd
Thaba 'Nchu ♂	75	83	17	52	18	19	3.5	3	3rd
„ ♂	67	69	16	45	16	17	3.5	2.5	3rd
„ ♂	71	73	18	48	17	18	3.5	2.5	3rd
Vryburg ♂	73	?	19	46	17	17	3.5	3.5	3rd
„ ♂	85	123	23	52	19	20	4	4	3rd
„ ♀	56	59	17	38	16	15	3	2.5	3rd
Devondale ♀	77	65	16	45	17	17	2.5	2.5	3rd
Kraaipan ♀	90	80	18	52	19	19	3.5	4	3rd
„ ♀	88	74	23	49	18	17	3.5	3	3rd
Ramathlabama ♀	60	67	17	40	15	16	3	3	3rd
Otto's Hoop ♀	85	?	19	48	17	18	4	3	3rd
Pretoria ♂	74	82	22	47	17	19	3	3	3rd
„ ♂	82	103	20	50	18	18	4	3	3rd
Steyensburg ♀	70	55	17	46	15	17	3.5	3	3rd
Baralong Farms ♀	84	72	18	46	17	18	3	3	3rd
„ ♀	83	67	19	49	17	18	3.5	3	3rd
Pienaar's River ♀	87	?	18	47	16	16	3.5	3.5	3rd

		1.	2.	3.	4.	5.	6.	7.	8.	9.
Pienaar's River	♂	78	84	17	48	17	18	3·5	3·5	3rd
"	♀	90	85	20	51	17	17	3·5	3·5	3rd
"	♀	82	71	18	45	16	16	3·5	3·5	3rd
"	♀	84	67	18	45	17	17	3·5	3	3rd
"	♂	82	115	19	52	18	19	4	3	3rd
"	♀	82	75	17	44	16	16	4	4	3rd
"	♂	81	101	18	50	18	18	4	3	3rd
"	♂	81	104	18	49	18	18	3·5	3·5	3rd
"	♂	86	107	19	50	18	19	3·5	3	3rd
"	♀	77	72	17	46	15	17	3	3	3rd
"	♀	68	66	16	41	14	16	3	3	3rd
"	♀	77	62	17	46	16	17	3	3	3rd
"	♂	80	115	18	50	18	17	3·5	3	3rd
"	♂	82	95	18	50	18	20	3	3	3rd
Towani	♂	71	104	17	48	17	18	3·5	3	3rd
"	♂	73	101	17	44	15	17	3·5	3	3rd
SOUTH AFRICAN MUSEUM:										
Burghersdorp	♀	74	60	17	46	16	17	3	3	3rd
"	♂	70	70	16	46	16	17	3	3	3rd
"	♂	70	65	16	48	17	18	3	2	3rd
Smithfield	♀	68	69	18	46	16	16	3·5	3	3rd
"	♀	83	73	23	52	20	20	4	3	3rd
O'okiep	♀	72	62	18	51	17	19	3·5	3·5	3rd
"	♂	71	71	16	48	17	19	3	3	3rd
Vredefort Road	♀	71	66	15	45	15	16	3	2·5	3rd
"	♀	75	91	16	50	17	19	?	3	3rd
"	♂	74	92	16	49	18	19	3	2·5	3rd
Mochudi	♀	79	88	17	49	17	19	?	3	3rd
"	♀	91	84	19	50	17	19	3·5	3	3rd
"	♂	94	121	20	53	19	20	4	3	3rd
"	♂	85	110	20	50	18	19	4	4	3rd
Salisbury	♀	77	87	23	44	16	17	3	3	3rd
Schishawasha	♂	73	102	19	46	18	18	3	3	3rd
"	♂	73	?	18	44	17	18	3	2·5	3rd & 4th
"	♀	78	61	22	41	15	16	3·5	3	3rd
"	♀	76	87	18	43	16	16	3	3	3rd
Mazoe	♂	78	96	18	45	16	16	4	3	3rd
"	♀	79	?	18	40	15	15	3·5	3	3rd
Bindura	♀	79	87	18	45	16	16	3·5	3·5	3rd
Impotuni Dis., Rhod.	♂	73	95	17	46	16	18	3	3	3rd
ALBANY MUSEUM:										
Bloemfontein	♀	82	66	20	47	18	18	3	3	3rd
Potchefstroom	♂	65	73	16	42	16	17	3	2	3rd
Pretoria	♂	75	93	17	43	16	16	3	3	3rd
Doornkop	♀	79	65	24	43	16	16	3	3	3rd
"	♀	80	?	19	45	16	16	3	3	3rd
"	♀	68	63	16	40	15	16	3	2	3rd
"	♂	74	86	19	47	17	17	3·5	3	3rd
"	♀	70	58	16	43	15	16	3	2	3rd

The following observations are a result of the study of the whole material.

First with reference to the collection in the British Museum :

The length of the head may be $4\frac{1}{4}$ times that of the head and body ; the tibia may equal or even slightly exceed the length of the head ; the third and fourth toes are exceptionally equal ; the fifth toe may extend as far as the first (two males from Barberton, two from Vredefort Road and two from Bulawayo, two females from Bulawayo, all the specimens from Mazoe) ; the tail may be $1\frac{1}{2}$ times as long as the head and body. Ventral scales feebly but very distinctly keeled and mucronate in a female from Vredefort Road, also in a male and female from Bulawayo. Two series of preanal pores ; up to 19 scales under the third toe in a male from Bulawayo and in another from Mazoe.

The collections in the museums of South Africa :

The enlarged dorsal scaling as in typical specimens of *A. aculeata* (Pienaar's River, Selati River, Metlepetse River).

Fifth toe extending as far as the first (Pienaar's River, Towani, Pretoria, Witpoort, Kaalplaats, Waterberg, Zand River, Metlepetse River).

Head broader than long (Pretoria).

Toes slender (Pretoria, Witpoort, Kaalplaats, Selati River, Zand River, Metlepetse River).

Head longer than broad (Pretoria, Rosslyn, Magaliesberg).

Two cases were noted where the preanal pores were in two rows.

The following combinations of characters were noticed in individual specimens :

1. Otto's Hoop ♀. Dorsal scaling exceptionally rough and mucronate throughout ; enlarged spinose scales on the sides of the head and neck ; ventrals smooth.

2. Thabanchu ♂. Ventrals smooth ; enlarged dorsals not in longitudinal series ; head-scales as in *A. aculeata* from Kimberley.

3. Baralong Farms ♀. Ventrals slightly keeled on the chest and abdomen ; dorsal scaling as in *A. aculeata*, by no means very rough ; tail very compressed laterally, not crested.

4. Pienaar's River 3 ♂ ♀. The fifth toe extending as far as the first.

5. Pretoria ♀. Head-scales very strongly keeled, subconical on either side of the occiput ; enlarged dorsal scales arranged in two longitudinal series about the centre of each side, those in the centre of the back arranged in 4 clusters round 4 lighter spots ; smaller dorsals strongly keeled but not mucronate.

6. Vygeboompoort ♂. Third toe slightly longer than the fourth on the right foot, same toes equal on the left foot. Two similar cases of this are noticed. Several specimens from this locality are most difficult to place.

7. Pretoria ♀. Head slightly longer than broad; fifth toe extending as far as the first; ventrals feebly keeled.

8. Zoutpan ♀. Large scales very few; toes fairly slender; scales on upper tibia equal; head-scales only very feebly keeled. This specimen seems to be near *A. armata*.

9. Vygeboompoort ♂. Toes and dorsal scaling as in typical *A. armata*. Otherwise the same as *A. distanti*.

10. Vygeboompoort ♀. Dorsal scaling, head and toes as in typical *A. armata*. Ventrals feebly keeled; scales on upper surface of tibia unequal.

11. Metlepetsi River ♀. Toes rather slender, fifth extending as far as the first; dorsal scaling like that of *A. aculeata*; scales on upper surface of tibia very unequal.

12. Doornkop ♀. Head and dorsal scaling very like those of *A. armata*. Ventrals rather strongly keeled, but not mucronate; toes short and thick, fifth not extending as far as the first. Another female from the same locality has a very rough head-scaling, it being subconical throughout.

13. Mazoe ♂. General appearance like *aculeata*; fifth toe extends as far as the first; scales on upper surface of tibia sub-equal.

14. Mazoe ♀. Fairly typical as regards dorsal scaling; ventrals feebly but distinctly keeled, strongly so and mucronate on the chest and sides. Head much longer than broad.

15. Bindura, ♀. Dorsal scaling as in *A. armata*; scales on upper tibia unequal; feet and toes like *A. distanti*, except that the fifth toe extends as far as the first. Ventrals feebly but distinctly keeled throughout. Head like *A. armata*.

16. Schishawasha ♀. Dorsal scaling by no means rough; no trace whatever of a dorsal crest.

17. Smithfield ♀. Shows very rough scaling, not unlike specimens from Otto's Hoop.

Another specimen labelled "Mashonaland" has the general appearance of *A. aculeata*; the fifth toe extends as far as the first; scales on upper surface of tibia subequal.

Two males and two females from Mochudi are exactly like *A. aculeata*, except that the third toe is the longest, and in the case of two of them the fifth toe does not extend as far as the first. A female is the same as *A. aculeata* in every respect, save that the third toe is much longer than the fourth.

A half-grown specimen from Setlagoli has the scaling and other particulars exactly as in *A. distanti*, but the fourth toe is the longest.

One example from Driekoppen, Hanover Division, referred by us to this variety, greatly resembles those from Thaba 'Nchu. Others from the same localities have the ear-opening somewhat smaller than is generally the case in specimens from the Transvaal.

The scaling reaches its maximum roughness in specimens from Otto's Hoop (which are almost as rough as typical specimens of *A. hispida*); further north these give place to a variation with a lepidosis not nearly as rough, and on the north-west the scaling becomes almost typical of *A. aculeata* (Plumtree and Bulawayo). These again give place on the north-east to a group which merges gradually into *A. armata*.

The material examined by the junior author shows conclusively that not one of the characters adduced for the specific distinction of *Agama distanti* is constant. Yet by using the following characters in combination it may be possible to distinguish the form as a variety.

From *A. hispida*, by the larger ear-opening (with about 20 per cent. exceptions), by the less tubercular head-scales, with or without a shallow pit in the pineal scale, fewer scales round the body (85 to 115, usually at least 90, instead of 70 to 85), smooth or feebly keeled ventral scales.

Whenever the ventral scales are strongly keeled (1 specimen Pienaar's River, 1 Potchefstroom, 1 Pretoria, 1 Witpoort, 2 Doornkop), either the ear-opening is larger than in *A. hispida* or the head-scales are less tubercular. The shorter fourth toe in conjunction with the larger ear-opening will in most cases suffice for the distinction from *A. brachyura*, which has 80 to 90 scales round the body.

From *A. aculeata* by the shorter fourth toe, but when, as rarely happens in *A. distanti*, the third and fourth toes are equal, it will be necessary to resort to the generally unequal size of the scales on the tibia and the shorter tail of the latter. But uncertainty will result in many cases, and it must be admitted that the identification of certain specimens such as a few from Kimberley will be arbitrary.

From *A. armata* the distinction will be more difficult and more arbitrary still. We have based it on combinations of characters: shorter hand, less slender toes, more irregular lepidosis of the back and tibia (85 to 115 scales round body *versus* 73 to 100), but with unsatisfactory results, and it seems hopeless to attempt a comparative definition of the two forms except as applying to the majority of the specimens from a given district.

Such being the state of things, we are driven to the conclusion that *A. distanti* cannot be regarded as a species, and that its claims to rank as a variety can only be accepted in so far as that conception expresses an ill-defined grade in evolution.

According to P. A. Methuen this form is generally found on the plains, but sometimes also in valleys or at the bases of kopjes, where stones may be present. It occasionally climbs the thorn trees at a height of six feet or more.

The food consists largely of termites, for which it burrows into the nests,

D. VAR. ACULEATA.

Agama aculeata, Dum. & Bibr. Erp. Gén. iv, p. 499 (1837); Bouleng. Cat. Liz. i, p. 351 (1885).

Agama infralineata, Peters, Mon. Berl. Ac. 1877, p. 613.

This is certainly the *Agama* so named by the authors of the *Erpétologie Générale*, but doubts may be entertained as to its being the *A. aculeata* of Merrem, which is probably a synonym of *A. hispida*. The name is therefore only used provisionally. The senior author has recently united this form with *A. armata*, but we now believe the two deserve to be upheld as distinct varieties, the latter differing in its typical form in the head being longer than broad and the ventral scales decidedly keeled; however, there are so many annectant specimens that a specific separation is not warranted.

Description of the specimens in the British Museum:

Form.—Body more depressed than usual in *A. armata*. Head as long as broad; snout short, rounded; canthus rostralis very short; nostril directed outwards, in a convex but not tubular shield, pierced on or just below the canthus rostralis; length of head $3\frac{3}{4}$ to $4\frac{2}{3}$ times in length to vent. Diameter of ear-opening equal to or a little less than cleft of closed eye. Limbs short or moderately elongate; the hind limb, pressed against the body, reaches the shoulder, the neck, or the ear; length of hand equal to or greater than depth of head; fingers and toes as in *A. armata*; tibia as long as, or shorter or longer than the head, shorter than the foot. Tail cylindrical, moderately slender, longer ($1\frac{1}{6}$ to nearly $1\frac{1}{2}$) than head and body.

Measurements:

	1.	2.	3.	4.
Snout to vent	105	80	83	93
Head	24	21	21	21
Width of head	24	21	21	21
Depth of head	16	12	14	13
Diameter of eye-cleft	4.5	4.5	4	4
„ „ ear-opening	4	4	4	3.5
Fore limb	47	37	40	45
Hand	18	14	15	16
Hind limb	68	55	52	58
Tibia	24	19	18	21
Foot	27	21	19	22
Tail	154	105	?	120

1. ♂, Kimberley. 2. ♂, Okwa, Bechuanaland. 3. ♀, Ladysmith. 4. ♀, Damaraland.

Lepidosis.—Upper parts with strongly keeled scales, some or all shortly mucronate, with more or less enlarged ones which are strongly mucronate and

disposed in 3 more or less regular longitudinal series on each side of the back ; 75 to 100 scales round the middle of the body ; groups of spinose scales on the side of the neck and near the ear-opening, the largest much shorter than the diameter of the latter ; a low but very distinct dorsal crest, usually continued on the anterior part of the tail. Upper head-scales unequal, smooth or feebly keeled, one or two transverse series on the occiput more or less enlarged and subconical ; occipital enlarged, not or but feebly pitted ; 10 to 15 scales across the head from one superciliary series to the other ; 10 to 15 upper labials on each side ; 2 to 4 series of scales between the upper labials and the nasal. Gular and ventral scales smooth or feebly keeled, not or but slightly mucronate. Upper scale, at base of claw, not or but slightly longer than the others ; 15 to 20 scales in a longitudinal series under the third or fourth toe. Caudal scales strongly keeled and mucronate, not forming whorls, more or less unequal in size. Scales on upper surface of tibia usually equal in size.

Male with a single row of rather small preanal pores.

Coloration.—Pale brown, light yellow, yellowish brown, dark brown or greyish above, uniform, or with dark brown or blackish spots (4 on either side of the vertebral line), or wavy cross-bars (2 on the nape, 4 on the back), sometimes with a series of large light spaces between the dark ones on the vertebral line, and a -shaped light mark on the nape, or with a light vertebral stripe, with a wavy lateral one at either side, sometimes with two dark cross-bars on the head, between the eyes, or with a V-shaped light mark between the eyes and a light bar across the forehead in front of the eyes ; sides and top (just over occiput) of head, in males, sometimes blue-green or blackish, limbs and tail with more or less distinct dark cross-bars. Females sometimes exhibit larger blood-red blotches at either side of the vertebral line. Lower parts white, throat often with bluish or blackish wavy longitudinal lines, in males with a central blackish blotch or even entirely black, belly sometimes with traces of a dark network or of wavy longitudinal lines. Neck, chest and sides brick red in breeding males.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
BRITISH MUSEUM :									
S. Africa ♂	105	148	24	68	24	27	4.5	4	4th
Deelfontein ♂	69	86	17	50	17	18	3.5	3	4th
Ladysmith ♂	75	100	20	52	17	20	4	3.5	3rd
„ ♂	59	74	16	43	15	17	3.5	3.5	3rd
„ ♀	83	?	21	52	18	19	4	4	3rd
Okwa, Bechuanaland ♂	80	105	21	55	19	21	4.5	4	4th
„ „ ♂	73	98	18	49	17	19	4	3.5	3rd & 4th
„ „ ♂	61	80	16	40	13	16	3	2.5	3rd & 4th

	1.	2.	3.	4.	5.	6.	7.	8.	9.
Tango, Bechuanaland ♂	58	68	15	40	13	15	3·5	3	3rd
" " ♂	58	66	15	41	13	16	3·5	3	3rd & 4th
Mopani Forest, Bechuanaland ♀	62	75	17	44	15	16	3·5	3	3rd
Gt. Karas Mt., S. Namaqualand ♀	88	117	21	60	21	23	4·5	4	4th
Damaraland ♀	93	120	21	58	21	22	4	3·5	3rd & 4th
" ♀	75	?	18	55	18	21	4	3	4th
" ♀	69	97	17	49	17	19	3·5	3·5	4th
KIMBERLEY MUSEUM:									
Van der Byl's Kraal ♀	99	109	21	61	21	23	4	3	4th
De Aar ♀	86	?	19	55	19	21	3	4	4th
" ♀	85	98	20	56	20	21	4	3	4th
Britstown ♂	76	104	19	54	18	22	4	3	4th
Fort Richmond ♀	101	112	21	57	20	22	4	3	4th
" ♂	105	151	23	64	21	23	4	3	4th
" ♂	100	143	23	63	23	23	4	3	4th
Belmont ♂	79	110	18	52	18	20	4	2·5	4th
Spreeuwiontein, ♂	84	116	20	55	19	21	3·5	3·5	4th
Enslin ♂	92	122	21	59	20	23	4	4	4th
" ♂	93	130	20	59	20	22	4	4	4th
" ♂	106	155	23	65	22	23	4	3·5	4th
" ♂	83	113	19	47	19	23	3	3	4th
Upington ♂	103	160	23	59	23	26	4	3	4th
" ♀	83	100	18	58	18	22	3	3	4th
" ♀	73	87	19	52	18	21	3·5	3·5	4th
" ♀	18	?	20	58	20	22	4	3	4th
" ♀	70	100	18	51	18	21	3·5	3·5	4th
Modder River ♀	95	103	21	54	18	20	4	3	4th
" ♂	98	136	22	59	22	22	4	3	3rd & 4th
" ♀	90	109	21	56	21	21	4	3	3rd & 4th
Kimberley ♀	76	?	18	54	18	20	4	3	4th
" ♂	95	139	21	61	22	22	5	4	4th
" ♂	81	102	20	57	20	21	4	3	3rd & 4th
" ♀	95	107	21	59	21	22	4	3	4th
" ♀	83	?	19	52	19	21	4	3	4th
" ♂	91	125	21	59	20	23	4	3	4th
" ♂	101	153	23	61	21	22	5	4	3rd & 4th
" ♀	90	83	20	54	18	22	4	3	3rd & 4th
" ♂	94	?	21	60	20	24	4	3	3rd & 4th
" ♀	71	80	18	49	18	20	3	2	4th
" ♂	91	131	21	59	21	23	4	3	4th
" ♂	98	155	21	59	21	23	4	3	4th
" ♀	88	106	19	53	19	21	4	4	4th
" ♀	110	110	23	58	22	23	4	4	3rd
" ♂	98	137	24	66	22	24	4	3	4th
" ♀	102	?	21	57	21	22	4	3	4th
" ♂	104	145	24	64	23	24	4	4	4th slightly
" ♂	106	120	23	55	20	21	5	3	3rd & 4th

		1.	2.	3.	4.	5.	6.	7.	8.	9.
Kimberley ♂	.	106	146	24	69	24	25	4	4	4th
" ♂	.	112	?	24	71	24	26	4	4	4th
" ♂	.	72	98	19	53	18	21	3.5	2	3rd & 4th
" ♀	.	94	110	20	59	20	20	4	4	3rd & 4th
" ♂	.	98	118	22	56	21	25	4	4	3rd & 4th
" ♂	.	111	156	24	69	24	26	5	4	3rd & 4th
" ♀	.	82	?	19	53	19	20	4	3.5	4th
" ♀	.	93	99	20	56	20	20	3.5	3.5	3rd
" ♂	.	92	130	19	61	19	23	4	4	4th slightly
" ♂	.	105	140	23	68	23	25	4	4	4th slightly
" ♂	.	103	144	21	64	21	23	4	4	3rd & 4th
" ♂	.	106	144	22	64	22	25	4	4	3rd & 4th
Barkly West ♀	.	98	122	21	61	21	23	4	3.5	4th
Riverton ♀	.	98	?	21	57	21	22	4	3	3rd & 4th
" ♀	.	83	?	19	55	19	20	?	2.5	4th
Delpont's Hope ♀	.	68	?	18	50	17	20	3	3	3rd & 4th
" ♀	.	102	126	21	59	21	22	4.5	4.5	4th
" ♀	.	90	97	19	54	19	21	4	3	4th
" ♂	.	94	127	21	57	19	22	4	4	3rd & 4th
" ♂	.	89	?	20	63	20	24	5	4	3rd & 4th
Daniel's Kuil ♀	.	73	97	19	53	17	21	3.5	3	4th
" ♂	.	94	?	22	67	22	26	4	4	4th slightly
" ♂	.	76	101	18	56	17	23	3.5	3.5	4th
" ♂	.	92	?	22	64	21	25	3.5	4	4th
" ♂	.	74	?	18	50	17	20	3.5	3	4th
" ♀	.	75	?	19	60	19	23	3.5	3.5	4th
Kuruman ♂	.	97	?	23	67	22	25	4	3	4th
Lower Molopo* ♂	.	87	111	21	61	21	24	4	4	4th
" ♂	.	92	?	21	64	21	26	3	3	4th
" ♂	.	89	146	20	54	20	25	4	4	4th
" ♂	.	103	152	22	64	22	26	4	4	3rd & 4th
" ♂	.	112	171	24	66	24	24	4	3	4th
" ♀	.	80	102	20	57	20	23	3.5	3.5	4th
" ♀	.	72	100	22	55	22	23	3	3	4th
Taungs ♀	.	63	88	15	45	15	18	3	3	4th
" ♂	.	94	121	20	61	21	23	4	3	4th
Zwart Modder-Rietfontein ♂	.	104	154	23	63	23	24	4	3	4th
" ♀	.	94	127	21	58	20	22	4	3	4th
Watersmeet ♀	.	94	92	21	59	21	22	4	3	4th
Vryburg ♀	.	89	112	19	48	19	20	3	3	4th slightly
Dry Harts River ♂	.	80	?	19	58	19	22	3.5	3	4th
Genesa ♂	.	108	158	24	66	23	25	4	4	4th
" ♂	.	108	?	23	63	23	23	4	4	4th
" ♀	.	96	106	21	58	20	22	4	3	3rd & 4th
" ♀	.	69	93	17	48	16	19	3	3	4th
" ♀	.	65	88	16	46	16	19	3	2.5	4th

* The course of the Molopo River between its junction with the Nosob River and Smalvisch Kop.

		1.	2.	3.	4.	5.	6.	7.	8.	9.
Lower Nosob*	♂	98	?	22	64	22	26	5	4	4th
"	♂	110	143	23	65	22	26	4	4	4th
"	♂	83	?	?	61	21	23	4	3	4th
"	♂	103	168	24	64	22	24	4	3	4th
"	♂	104	153	23	61	23	25	4	4	4th
"	♂	109	163	23	64	23	26	5	4	4th
"	♂	99	144	23	61	23	25	4	4	4th
"	♀	90	123	21	60	21	24	4	4	4th
"	♀	79	106	18	53	18	21	4	3	4th
"	♀	76	107	18	52	18	22	4	3	4th
"	♂	113	?	25	66	25	26	4	4	4th
"	♀	82	106	18	53	18	21	3	3	3rd & 4th
"	♀	86	?	20	52	20	21	4	3	4th
"	♀	73	105	19	51	18	20	3	3	4th
Ky Ky	♂	100	143	22	62	22	24	4	3	4th
"	♂	92	118	22	65	22	25	4	4	4th
"	♂	109	152	24	63	24	26	4	4	4th
"	♂	101	149	23	65	23	26	4	3	4th
"	♂	108	146	22	61	20	24	4	3	4th
"	♂	93	134	21	58	21	22	4	3	4th
"	♂	88	?	22	60	21	24	4	3	4th
"	♂	93	137	21	61	21	23	4	4	3rd & 4th
"	♂	92	162	22	64	21	26	4	3	4th
"	♂	99	143	22	63	22	24	4	3	4th
"	♀	86	102	20	54	20	21	4	3	4th
"	♂	89	134	23	62	22	26	4	3	4th
"	♀	75	?	18	50	18	21	4	4	4th
"	♀	81	?	19	55	19	22	4	4	4th
"	♀	75	103	18	54	18	22	4	3	4th
"	♂	103	158	22	65	23	25	4	3	4th
"	♂	106	?	24	67	24	25	4	4	4th
"	♂	89	136	21	61	21	25	4	4	4th
"	♂	99	?	22	61	22	24	4	3	4th
"	♂	104	141	24	61	23	24	4	4	4th
"	♂	96	?	23	65	23	25	4	4	4th
"	♂	86	132	21	57	21	24	3	3	4th
"	♀	81	112	19	54	19	22	4	3	3rd & 4th
"	♀	93	116	21	58	21	21	4	4	4th
"	♀	81	120	19	56	19	23	4	3	4th
"	♀	66	92	18	49	17	19	3	3	4th
"	♀	78	104	19	55	19	22	3·5	3·5	4th
"	♀	75	106	18	54	18	21	3·5	3·5	4th
"	♂	80	122	20	51	20	23	4	3	4th
"	♀	81	99	19	48	18	19	4	4	4th
"	♀	74	109	19	56	19	22	3·5	3·5	4th
"	♀	71	91	18	47	17	21	3	3	4th
"	♀	80	99	21	51	18	19	4	2·5	4th
Albrechts	♂	107	160	24	69	25	26	5	4	4th

* The course of the Nosob River between Ky Ky and its junction with the Molopo River.

South African Agamas allied to Agama hispida and A. atra. 257

	1.	2.	3.	4.	5.	6.	7.	8.	9.
ALBANY MUSEUM:									
Fish River ♂	102	143	24	61	24	24	4	3	4th slightly
Cradock ♂	86	107	20	55	19	21	3	3	4th
Victoria West ♂	78	?	20	50	18	21	3·5	3·5	4th
" ♂	85	?	20	55	19	22	3	3	4th slightly
" ♂	99	119	24	61	23	23	4·5	3	4th
Beaufort West ♀	91	106	20	57	20	23	3·5	3·5	4th
Douglas ♂	75	?	20	56	20	23	4	3	4th
Kimberley ♂	89	121	22	56	21	21	4	3	4th
" ♂	96	129	22	59	21	23	4·5	3	4th
" ♀	82	?	20	57	20	22	3·5	3	4th
" ♀	98	117	22	60	22	23	4	4	4th
" ♀	83	103	19	54	20	21	3·5	3·5	4th
" ♀	74	?	18	48	17	19	3	2	4th slightly
" ♂	73	123	22	64	22	25	4	4	3rd & 4th
" ♂	84	113	19	53	19	21	3·5	3·5	4th
" ♂	107	138	24	62	23	23	4·5	3·5	4th
N.W. Gordonia ♂	100	154	24	66	24	25	5	4	4th
" ♀	82	?	19	54	19	20	3·5	3	4th slightly
Rietfontein ♂	108	164	24	68	23	28	4	3	4th
" ♂	107	165	23	68	24	27	4	4	4th
Ky Ky ♂	100	143	21	63	23	24	4	3	4th
" ♂	94	146	23	65	22	25	4	3	4th
Grootfontein ♂	84	119	19	53	19	20	3	3	4th
S. AFRICAN MUSEUM:									
Ookiep ♂	102	152	24	67	24	26	4	4	3rd & 4th
" ♀	97	105	23	65	22	27	4	4	4th
Pt. Nolloth ♂	104	136	20	63	25	25	4	2	4th
Burghersdorp ♀	83	94	21	55	20	22	4	3·5	4th
Neighb'hd. of Ludritzbuht ♂	97	137	22	61	21	23	4	2·5	4th slightly
" " ♂	98	134	22	57	21	22	4	4	4th
" " ♂	101	?	25	65	23	24	4	4	4th
" " ♀	96	89	20	54	18	19	3	3	3rd & 4th
" " ♀	90	98	20	37	20	22	4	4	4th
" " ♀	87	?	20	60	26	22	3·5	3·5	3rd & 4th
" " ♀	85	88	20	56	19	21	3	3	3rd & 4th
Gamis ♂	83	116	20	58	20	23	4	3	4th
Areb ♂	84	125	20	54	18	22	3	3	4th
" ♂	96	157	23	63	23	24	4	3	4th
" ♂	90	132	22	63	22	26	4	3	4th
Otyimbingue ♀	96	?	22	58	21	22	4	3	3rd & 4th
" ♀	93	133	21	60	21	23	4	3	3rd & 4th
" ♀	86	107	21	58	21	23	4	3·5	4th
" ♀	92	123	22	62	22	23	4	3	4th
Nuragas, S.W. African Pro- tectorate ♂	81	?	21	60	20	22	4	3	3rd & 4th
TRANSVAAL MUSEUM:									
Kimberley ♂	100	133	22	61	22	23	4	4	4th
" ♂	106	138	24	66	24	25	4	3	4th

		1.	2.	3.	4.	5.	6.	7.	8.	9.
Kimberley ♂		100	127	24	63	23	24	4	4	4th
" ♂		78	89	19	53	19	22	3·5	3	4th
Plains near Wasserfall ♂		80	113	20	57	20	23	4	4	4th
" ♀		103	?	22	61	22	23	4	4	4th
" ♀		75	104	19	55	19	23	3·5	3·5	4th slightly
" ♀		75	97	19	54	19	23	3·5	3·5	4th
" ♂		79	?	20	56	20	24	3·5	3·5	4th
" ♂		86	125	20	52	20	24	3·5	3·5	4th
Below Little Karas Mts. ♀		109	125	25	68	24·5	26	4·5	4	3rd & 4th
Sandmund, Gt. Karas ♀		95	110	21	59	21	23	4	3·5	3rd & 4th
Kraaikluft, Gt. Karas ♂		114	160	25	66	24	26	4	3·5	4th

The following discrepancies between various specimens and the above description are noted :

Enlarged dorsal scales in a fourth longitudinal series : De Aar ♀. Very few and but slightly enlarged, inclining towards *A. methueni* : Upington ♀, N.W. Gordonia ♀, Rietfontein 2 ♂, Grootfontein ♂. Scattered irregularly : Beaufort West ♀, Plains near Wasserfall ♀.

Small dorsal scales not mucronate except low down on the sides : Britstown, Upington, Ky Ky, Zwart Modder, and, in fact, nearly all the Kalahari examples.

Scales on upper surface of upper tibia very unequal : Britstown, Watersmeet, Dry Hart's River, Ky Ky, N.W. Gordonia, Kimberley.

Ventral scales feebly but distinctly keeled : Schoemansfontein, Jacobsdal Division, Kimberley, Daniel's Kuil, Taungs, Dry Hart's River, Genesa, Lower Nosop, Ky Ky, Beaufort West.

Head-scaling small, subconical in places, otherwise strongly keeled : Kimberley 5 ♂.

Parietal scale entirely absent : Albrechts ♂.

Preanal pores in two rows : 4 Kimberley, 1 Areb.

Hind limb reaching to the middle of the ear : Britstown ♂. Fifth toe extending as far as the first : Spreeuwfontein, O.F.S. ♂, Daniel's Kuil ♂, Dry Hart's River ♂, Ookiep ♂, Burghersdorp ♂, Lüdrizbucht ♂, Otyim-bingue ♀ ♀, Plains near Wasserfall ♂, 3 ♀, Kraaikluft ♂.

Fifth toe extending beyond the first : Albrechts ♂.

Third and fourth toes equal on the right foot, fourth slightly the longer on the left : Kimberley ♂.

Third and fourth toes equal on left foot, fourth the longer on the right : Kimberley ♀, Genesa ♀.

Toes short and thick : Kimberley ♀, Grootfontein ♂, Lüdrizbucht ♂.

Feet abnormally long and slender : Douglas ♂, Burghersdorp ♀. Gamis ♂, Otyim-bingue 2 ♀, Plains near Wasserfall 3 ♀, 2 ♂.

Head longer than broad : Daniel's Kuil ♂, Otyim-bingue 2 ♀, Plains near Wasserfall ♀ ♂

Eye-cleft and ear equal on the right side, unequal on the left: Ky Ky ♂ ♀, Spreeuwfontein, O.F.S. ♂.

The following unusual combinations of characters are noticed in individual specimens:

Britstown ♂. Scaling on upper surface of tibia very unequal (as in typical *A. distanti*); adpressed hind limb reaching the middle of the ear-opening; small dorsal scaling not mucronate.

A young from Schoemansfontein, O.F.S. (about 30 miles S.E. of Kimberley) has the dorsal scaling like specimens from Bloemfontein, the fourth toe longest and the fifth extending well beyond the first. Ventral scales feebly keeled.

Kimberley ♀. This specimen differs very much from the description given at the beginning. The toes short and thick, enlarged dorsals very much enlarged, ventral scales feebly but distinctly keeled, scales on upper surface of tibia unequal. Third toe the longest.

Kimberley ♀. Third and fourth toes equal on the left foot, the fourth longer on the right foot; scaling as in *A. distanti*.

Kimberley ♂. Toes very short and thick; tail unusually short for a ♂; preanal pores in two rows.

Kimberley ♀. Agrees with the description of *A. distanti* in every respect save that the scales on the upper surface of the tibia are equal.

Six specimens from Daniel's Kuil exhibit the following characters. A ♂ has enlarged dorsal scales arranged in three clusters on three dark brown patches at either side of the vertebral line, a very distinct dorsal crest extending the full length of the tail; scales on upper surface of tibia unequal. The colour on the ventral surface of this specimen is very peculiar, there being broad red wavy lines forming a large-meshed network on the whole surface, especially on the chest; longitudinal cobalt-blue lines under the head, throat blue-black; head slightly longer than broad. A ♂. Scaling the same as in the preceding but enlarged dorsal scales much smaller, scales on tibia subequal; fifth toe does not extend quite as far as the first.

A ♂. Enlarged dorsal scales arranged in three more or less longitudinal series on either side; reddish brown network ventrally.

A ♂. Dorsal scaling as in first specimen; scales on tibia equal.

A ♀. Scaling as in first specimen; ventral scales feebly keeled.

A ♀. Ventral scales keeled on the chest, otherwise typical.

Taungs, ♀. Head as broad as long; dorsal scaling and feet as in typical *A. armata*; ventral scales feebly keeled; scales on upper portion of left tibia very unequal, equal on the right; fourth toe longest.

Watersmeet, Vryburg, ♀. Head-scales very strongly keeled throughout as in typical *A. distanti*; scales on upper portion of tibia very unequal; ventrals strongly keeled throughout, strongly mucronate on the abdomen

and at the sides; occipital scale very much enlarged; fifth toe not extending as far as the first, fourth the longest.

Dry Hart's River, ♂. Dorsal and head scaling as in typical *A. distanti*; scales on tibia very unequal; ventrals feebly but distinctly keeled, fifth toe does not extend nearly as far as the first, fourth toe the longest.

Genesa, ♀. Third and fourth toes equal on the left foot, fourth the longer on the right.

Genesa, ♀. Head and body scaling as in *A. anchietae*; ventral scales feebly keeled throughout, feet long and slender, fourth toe the longest.

Genesa, ♀. Head slightly longer than broad, scales thereon keeled; toes very long and slender; dorsal scaling the same as in specimens from Mariannhill; ventrals smooth.

Ky Ky, ♀. Enlarged dorsals very few and only slightly enlarged; small scales not mucronate except low down on the sides. This applies to several specimens from Ky Ky and neighbourhood.

Ky Ky, ♀. Scales on upper tibia very unequal; enlarged dorsals in groups somewhat like certain specimens from Pretoria; head-scales very rough. This specimen seems quite close to *A. brachyura*, the ear-opening is 3.5 mm. on the right side, 2.5 mm. on the left side.

Reitfontein, ♂. Dorsal scaling and head-scaling as in *A. methueni*; enlarged dorsal scales very few and scattered irregularly, smaller ones keeled but not mucronate; tail rounded.

Ookiep, ♂. On plateau. Scaling throughout as in Kalahari specimens; tail laterally compressed, toes long and slender, fifth not extending quite as far as the first; scaling on tail in distinct whorls.

Pt. Nolloth, ♂. This was at first placed as *A. brachyura* but on further consideration it was transferred to *A. aculeata*, though the ear-opening (2 mm.) is rather smaller than is usual in the latter species; fifth toe extending as far as the first.

Lüdritzbucht, ♂. Dorsal scaling between *A. methueni* and *A. aculeata*, no trace of a dorsal crest; ear opening rather small.

Lüdritzbucht, ♂. Toes rather short and thick, fifth not extending quite as far as the first; scaling like that of *Gordonia* specimens.

Lüdritz, ♀. Dorsal scaling as in *A. aculeata* (typical); head-scales very unequal; head longer than broad, ventrals feebly but distinctly keeled.

Areb, ♂. Larger dorsal scales only very slightly enlarged, resembling *A. methueni*; head much longer than broad, scales thereon strongly keeled; ventrals feebly but distinctly keeled on the chest, under the head and on the sides of the abdomen.

Wasserfall, six specimens as follows: (1) ♂. Toes fairly long and slender, fifth not reaching first. Head only slightly longer than broad, scaling not unlike that of *A. methueni*. (2) ♀. Head much longer than broad, enlarged dorsals scattered, not forming a regular longitudinal series,

adpressed hind limb reaching well beyond the ear, toes long and slender, fifth extending beyond the first. (3) ♀. Feet very long and slender, fifth not extending quite as far as the first, head as long as broad. (4) ♂. Toes very long and slender, head slightly longer than broad. (5) ♂. Head as long as broad, feet and toes very long and slender. (6) ♀. Enlarged dorsals only slightly so and in 3 longitudinal series on either side. Toes very long and slender, fifth not extending as far as the first.

Kraaikluft, ♂. Toes moderately long, fifth not extending as far as the first, enlarged dorsals few.

Beaufort West, ♀. Enlarged dorsals scattered irregularly, not in longitudinal rows.

Gt. Namaqualand. Several ♂♂ show a rather gradual change from *A. aculeata* to *A. methueni*, some of them resembling *A. methueni* in dorsal scaling, others *A. aculeata*.

Victoria West, ♂. Dorsal scaling as in Kimberley specimens; head-scales very strongly keeled, subconical on the occiput; enlarged dorsals continued for a short distance on the tail.

There is scarcely any doubt that the specimens examined by us from the neighbourhood of Port Nolloth, which we are referring to this variety, link it up with *A. brachyura*; and those from the country round Kimberley and between it and Mafeking connect *A. aculeata* and *A. distanti*.

This *Agama* in the neighbourhood of Kimberley lives on the open veld, where it may be seen on stones, on the tops of wooden fence-posts or poised on the tops of thorn trees.

In winter it hibernates in holes, under stones and tins or in deserted termite heaps.

Like the typical *A. hispida* it is partly herbivorous, partly insectivorous.*

E. Var. ARMATA.

Agama armata, Peters, Mon. Berl. Ac. 1854, p. 616, and Reise n. Mossamb. iii, p. 42, pl. vii, fig. 2 (1882); Bouleng. Cat. Liz. i, p. 352 (1885).

We have no doubt as to the correct application of this term, the lizard having been carefully described and figured by Peters from specimens obtained by him in the interior of Portuguese East Africa, south of the Zambesi (Sena and Tetta). It is an Eastern form extending southwards to Natal.

Form.—Habit less stout than in the preceding, body usually less depressed. Head convex, longer than broad; snout short, rounded; canthus rostralis very short; nostril directed outwards, in a convex but not tubular

* For further particulars regarding life-history, etc., see Trans. Roy. Soc. South Africa, iii, pp. 151, 152; Rep. South African Assoc. Adv. Sci., 1917, p. 263.

shield, pierced just below the canthus rostralis; length of head $3\frac{3}{4}$ to $4\frac{1}{6}$ times in length to vent. Diameter of ear-opening equal to or a little less than cleft of closed eye (rarely only $\frac{2}{3}$). Limbs short or moderately elongate; the hind limb, pressed against the body, reaches the shoulder, the neck, the ear, or the temple; length of hand greater than depth of head; fingers more slender than in the preceding, third or third and fourth longest; tibia as long as or shorter than the head or the foot; toes longer and more slender than in the preceding, third and fourth equal, or third or fourth slightly the longer, fifth extending as far as first or slightly beyond, exceptionally not so far. Tail cylindrical, moderately slender, longer ($1\frac{1}{2}$ to $1\frac{3}{5}$) than head and body, rarely a little shorter (φ); sometimes very slender in φ .

Measurements:

	1.	2.	3.	4.
Snout to vent	67	66	84	77
Head	18	17	21	20
Width of head	17	15	18	17
Depth of head	11	10	12	12
Diameter of eye-cleft	3.5	3	4	4
„ ear-opening	3.5	3	4	4
Fore limb	31	31	36	35
Hand	12	12	15	14
Hind limb	45	46	52	44
Tibia	15	15	19	14
Foot	17	19	19	16
Tail	89	96	93	90

1. ♂, Natal. 2. ♂, Klukluwe, Zululand. 3. ♀, Gazaland, P.E.A.
4. ♀, Natal.

Lepidosis.—Upper parts, as a rule, not so rough as in the preceding; scales strongly keeled and usually shortly mucronate, the larger ones strongly mucronate, and arranged in three longitudinal series on each side of the back, exceptionally more irregularly distributed; 73 to 95 scales round the middle of the body*; the largest spinose scales near the ear-opening much shorter than the diameter of the latter; vertebral crest very low on the nape, more or less distinct on the back. Upper head-scales unequal, keeled, 2 to 4 on the middle of the snout more or less enlarged; occipital enlarged; 12 to 16 scales across the head from one superciliary series to the other; 10 to 13 upper labials on each side; 3 or 4 series of scales between the upper labials and the nasal. Gular and ventral scales usually keeled and mucronate, even strongly, but sometimes smooth or feebly keeled. Caudal scales strongly keeled and mucronate, not forming whorls, equal except at the base. Scales on upper surface of tibia subequal in size, rarely unequal.

* 80 to 86 in the types according to Peters.

14 to 20 scales under the 3rd or 4th toe. Male with a single or double row of rather small preanal pores.

Coloration.—Yellowish or greyish brown to dark brown above, the vertebral region sometimes lighter, uniform, or with 4 or 5 transverse series of dark spots on the body; some of the larger scales carmine (♀, Gazaland); head sometimes blackish above and bluish on the sides (♂, Natal, ♀, Gazaland); limbs and tail usually with more or less distinct dark cross-bars. Lower parts whitish, throat usually with bluish-grey or blackish wavy longitudinal lines; traces of a dark network sometimes present on the belly.

Particulars of Specimens Examined.

		1.	2.	3.	4.	5.	6.	7.	8.	9.
BRITISH MUSEUM:										
Gazaland, Portug. E. Africa	♀	84	93	21	52	19	19	4	4	3rd
Lourenço Marques	♀	57	63	16	42	14	17	3	2.5	3rd
Delagoa Bay	♂	65	88	17	45	15	17	3.5	3	3rd
Klulube, Zululand	♂	66	96	17	46	15	19	3.5	3	4th
"	♂	59	92	16	44	14	19	3	2.5	4th
Zululand	♀	75	99	18	50	16	19	4	3.5	3rd & 4th
Natal (Warren)	♂	67	89	17	45	15	17	3.5	3	3rd
" (Gurney)	♀	77	90	20	44	14	16	4	4	3rd
BULAWAYO MUSEUM:										
Mariannhill	♂	60	89	18	37	13	17	3	2	3rd & 4th
Bulawayo	♂	74	106	16.5	49	16.5	20	4	3	3rd
"	♂	73	97	17	49	16	16	3	3	3rd
"	♂	63	78	15	40	14	16	3	3	3rd
"	♂	71	?	16	48	16	19	3	3	3rd
"	♀	64	75	16	40	13	17	3	3	3rd & 4th
"	♀	66	80	16	46	15	17	3	3	3rd
"	♂	74	117	17	51	17	21	3	3	3rd
"	♂	80	90	18	47	16	18	3	3	3rd & 4th
"	♂	65	73	15	44	15	16	3	3	3rd
"	♂	70	95	17	48	16	18	3	3	3rd
"	♂	67	80	17	47	15	18	3	3	3rd
"	♂	84	111	18	56	18	21	3	3	3rd
"	♂	83	101	18	50	17	19	3	3	3rd
"	♀	77	69	17	46	16	17	3	3	3rd
"	♂	74	96	16	45	16	19	3	3	3rd
"	♂	64	86	16	25	15	17	3	3	3rd
"	♂	89	118	19	54	19	20	3.5	3.5	3rd
"	♂	85	118	19	51	18	20	3	3	3rd
"	♂	95	118	20	56	20	22	3.5	3	3rd
"	♀	87	89	16.5	52	16	19	3	3	3rd & 4th
"	♀	65	80	20	43	14	17	3	3	3rd & 4th
"	♂	71	92	16	43	15	17	3	3	3rd
"	♀	71	88	17	46	16	18	3	3	3rd
N. Rhodesia	♀	80	79	18	49	18	19	3	3.5	3rd
Rhodesia	♂	64	92	20	43	15	18	3	2	3rd & 4th

	1.	2.	3.	4.	5.	6.	7.	8.	9.
NATAL MUSEUM:									
Natal ♂	53	69	15	36	11	14	2.5	2	4th slightly
Entendweni, Zululand ♂	55	89	18	44	13	18	3	2.5	4th
KIMBERLEY MUSEUM:									
Mariannhill ♀	57	?	14	40	13	17	3	2.4	3rd & 4th
" ♂	57	81	14	37	13	15	3	2.5	3rd & 4th
Rikatla ♀	73	82	17	47	17	18	3	3	3rd
" ♀	80	86	18	47	16	17	3	2.5	3rd
" ♀	61	83	15	47	16	19	3	2.5	3rd
Serowe ♂	78	?	19	50	18	18	3	3	3rd
Plumtree ♂	73	93	18	51	18	20	3	3	3rd
" ♂	64	78	16	44	15	17	3	3	3rd
Buluwayo ♂	54	70	16	38	14	15	3	3	3rd
" ♀	62	86	19	45	16	17	3	3	3rd
" ♂	75	?	23	64	15	18	3	3	3rd
Marandellas ♂	66	84	16	40	14	17	3	3	3rd
Salisbury ♀	75	70	17	43	15	17	3	3	3rd
ALBANY MUSEUM:									
Mariannhill ♀	75	79	18	43	15	16	3	2.5	3rd
" ♀	70	79	16	43	16	17	3	2	3rd
" ♀	64	?	14	38	13	16	3	2.5	3rd
" ♂	56	?	17	39	13	16	2.5	2.5	3rd & 4th
" ♂	51	75	13	34	11	15	2.5	2	3rd & 4th
" ♂	50	68	12	32	12	14	2	2	3rd & 4th
" ♂	48	62	13	32	12	15	2.5	2.5	3rd
Kwambonambi ♀	67	102	15	46	15	20	3	2.5	4th slightly
Wastdale, Rankin's Pass ♀	75	81	18	47	17	18	3	3	3rd
" " ♀	68	77	16	41	16	17	3	2.5	3rd
White River ♀	66	66	16	41	14	16	3	3	3rd
" ♀	74	?	17	41	16	16	3	3	3rd
Serowe ♀	81	93	18	46	17	18	3	3	3rd
Bulawayo ♂	86	114	19	50	18	20	3.5	3	3rd
Salisbury ♂	44	?	14	28	9	11	2	2	3rd & 4th
TRANSVAAL MUSEUM:									
Weenen, ♂	70	98	17	49	16	20	3	3	3rd & 4th
Indukuduku, Zululand ♀	64	95	15	47	15	20	3	2.5	3rd slightly
" " ♂	60	84	15	40	13	16	3	2	3rd
" " ♂	61	85	15	42	14	17	3	2	3rd & 4th
Pretoria Zoo ♂	68	86	16	47	16	18	3	2	3rd
Krantz View, Carolina ♂	70	80	17	44	14	16	3	3	3rd
Barberton ♀	73	66	16	43	14	17	3.5	3	3rd
Vygeboompoort ♀	71	?	17	46	14	18	3	3	3rd
" ♂	61	77	16	42	13	17	3.5	3	3rd
" ♂	69	98	17	47	15	18	3.5	2.5	3rd
" ♀	81	77	18	46	15	16	3	3	3rd
" ♂	71	99	17	42	15	17	4	3	3rd
" ♂	63	73	15	39	14	16	3	3	3rd
Lydenburgh Kranz ♀	56	70	15	42	15	17	4	3	3rd
Great Letaba River ♀	66	55	15	39	13	15	3.5	3.5	3rd

		1.	2.	3.	4.	5.	6.	7.	8.	9.
Mazambo	♂	50	78	14	39	13.5	16	3	2	3rd
"	♀	46	63	13	36	12	16	2.5	2	3rd
Transvaal	♀	73	70	17	46	15	17	3	3	3rd
Griffin Mine, Leydsdorp	♂	62	93	15	39	14	16	3	3	3rd slightly
"	♀	76	81	17	45	15	17	3	3	3rd
Bulawayo	♀	87	85	19	51	18	19	4	3	3rd & 4th
SOUTH AFRICAN MUSEUM:										
Natal	♀	60	76	15	42	14	17	3	3	3rd & 4th
Delagoa Bay	♂	74	?	19	50	18	19	4	3	3rd
Bulawayo	♂	87	125	18	51	18	21	4	3	3rd
"	♀	84	79	19	49	17	18	4	4	3rd
Livingstone	♀	74	71	17	41	14	16	3	3	3rd slightly
"	♀	76	78	16	43	15	16	3	3	3rd
Salisbury	♀	74	65	16	41	14	16	3	3	3rd slightly
"	♀	77	?	18	48	17	18	3	3	3rd slightly
"	♀	73	61	16	40	14	15	3	3	3rd
Schishawasha	♀	68	84	17	45	16	17	3	3	3rd slightly
"	♀	77	60	18	41	15	16	3	3	3rd
"	♂	76	?	20	46	16	17	4	3	3rd & 4th
"	♂	72	?	19	44	16	17	3.5	3	3rd & 4th
"	♂	77	99	18	46	17	17	3.5	3	3rd
"	♀	74	66	17	42	15	17	3	3	3rd
"	♀	72	73	17	42	16	18	3	3	3rd

Specimens differing from the foregoing description are as follows:

Enlarged dorsal scales in 2 longitudinal series on the sides: Plumtree ♂.

Scales on upper surface of tibia very unequal: Plumtree, ♂, Mariannhill, 3 ♀, Mazambo, ♀, Bulawayo, ♀, 2 ♂; Lydenburg Kranz, ♀.

Dorsal scaling like specimens of *A. distanti* from Pretoria: Plumtree, ♂, Bulawayo, ♀.

Preal pores in 2 rows: Marandellas, Bulawayo, 2.

Fifth toe not extending as far as the first: Serowe, ♀, N. Rhodesia, ♀, Indukuduku, ♀, Pretoria Zoo, ♂, Lydenburg Kranz, ♀, Mazambo, ♀, Griffin Mine, Leydsdorp, ♂, Bulawayo, ♂, 2 ♀.

The following combinations of characters may be noted:

Mariannhill, ♀. Enlarged dorsal scales in 3 longitudinal series on either side of the vertebral line and carried on to the tail for about $\frac{1}{4}$ of its length; scales on upper surface of tibia unequal; head-scales very rough, spinose scales at sides thereof very few and short; toes very long and slender; tail very slender, thick at the vent, then tapering suddenly; keels on caudal scaling forming longitudinal ridges.

Marandellas, ♂. Scarcely to be distinguished from the Mariannhill specimens; a second row of small preanal pores. All the young resemble those from Mariannhill in scaling, head characters and feet, except one, in which the head is as broad as long.

Eldorado, ♂. A young is just like the Mariannhill ones, except that the enlarged dorsal scales are only very slightly so.

Salisbury, ♀. Ventral scales feebly keeled throughout, but not mucronate; spinose scales on the sides of the head and neck very few and very short.

Giant's Castle, Natal. This specimen is damaged; dorsal scaling resembling that of *A. anchietae*, scarcely any enlarged ones; ventrals feebly keeled, not mucronate; no dorsal crest whatever; all head-scales more or less subconical; head slightly longer than broad; fifth toe extending as far as the first.

Lydenburg Kranz, ♀. Toes only moderately slender, fifth not extending as far as the first; head slightly broader than long; dorsal scaling as in typical *A. armata*; scales on upper surface of tibia very unequal; ventral scales strongly keeled.

Owing to the many discrepancies in specimens from Bulawayo and neighbourhood, it is advisable to give detailed notes on the individuals. In nearly all of them the head is longer than broad, and since this character is of more importance than the scaling, which shows such a wide range of variation, all these specimens are placed with *A. armata*.* In scaling and general appearance the specimens from Bulawayo and Plumtree resemble *A. aculeata*.

Bulawayo, ♀. Head-scales very strongly keeled; dorsal scaling as in *A. distanti*; fifth toe not reaching as far as the first; scales on upper surface of tibia unequal; ventrals feebly keeled on the chest; head much longer than broad.

Bulawayo, ♂.—Dorsal scaling as in *A. aculeata* from the Kalahari; toes fairly slender, fifth not extending as far as the first; ventral scales smooth; nuchal but no dorsal crest.

Bulawayo, ♂. Dorsal scaling like that of *A. aculeata* from Kalahari; toes long and fairly slender, fifth extending as far as the first; ventral scales smooth; nuchal but no dorsal crest.

Bulawayo, ♂. Dorsal scaling resembling that of specimens of *A. aculeata* from Kimberley; scales on upper surface of tibia unequal; toes long and fairly slender, fifth extending as far as the first; head longer than broad.

Bulawayo, ♂. Head much longer than broad; toes fairly short and thick, fifth reaching as far as the first.

Bulawayo, ♂. Dorsal scaling as in *A. aculeata*; toes long and fairly slender, fifth extending as far as the first; head longer than broad: scales on upper surface of tibia unequal.

* Of the specimens from Bulawayo and the neighbouring districts, 83 per cent. have the head longer than broad, 12 per cent. as long as broad, 4 per cent. broader than long; 45 per cent. have the 5th toe not extending as far as the 1st, 21 per cent. extending beyond the 1st, 33 per cent. extending as far as the 1st.

Bulawayo, ♀. Like *A. armata*, but the ventral scales are smooth.

Bulawayo, ♂. Toes long and slender, fifth extending as far as the first; head as long as broad. Otherwise like *A. distanti*.

Bulawayo, ♂. Dorsal scaling as in *A. aculeata*, from Kimberley; scales on upper surface of tibia unequal; toes long and fairly slender, third longest on the left foot, fourth slightly the longest on the right, fifth extending as far as the first; head longer than broad.

Bulawayo, ♂. Head much longer than broad; toes fairly short and thick, fifth reaching as far as the first.

Bulawayo, ♂. Dorsal scaling as in *A. aculeata*; toes long and fairly slender, fifth extending as far as the first; head longer than broad; scales on right tibia very unequal, equal on the left.

Bulawayo, ♂. Resembles *A. distanti* in every particular; but preanal pores in two rows.

Bulawayo, ♀. Like *A. armata* in all respects.

Bulawayo, ♂. Resembles *A. armata* in the character of the dorsal scaling and head; scales on upper surface of tibia very unequal.

Bulawayo, ♀. Head rather sharp-pointed; toes long and slender, fifth not extending as far as the first.

Bulawayo, ♀. Dorsal scaling as in typical *A. distanti*; scales on upper surface of tibia equal.

Bulawayo, ♂. Same as *A. armata* in every respect save that the ventrals are smooth.

Bulawayo, ♂. Scaling as in *A. distanti*, otherwise (head, toes, etc.) as in *A. armata*.

Bulawayo, ♂. Typical *A. armata*; ventrals smooth.

Bulawayo, ♂. Scales on upper tibia unequal; head as long as broad, scaling and general appearance as in *A. aculeata*; preanal pores in 2 rows.

Bulawayo, ♂. Scaling, etc., as in *A. aculeata*; head as long as broad.

Bulawayo, ♂. Exactly like *A. armata*; scales on upper tibia very unequal; ventrals feebly keeled.

Bulawayo, ♂. Head-scales very strongly keeled, subconical round the occipital and on the head over the ears; scaling otherwise as in *aculeata*.

Bulawayo, ♂. Resembles *A. armata* in dorsal scaling and head, but the scales on the upper surface of the tibia are very unequal.

Bulawayo, ♂. Scales on upper tibia unequal; head as long as broad; scaling and general appearance like *A. aculeata*; preanal pores in two rows.

Plumtree, ♂. The enlarged dorsal scales in two longitudinal series; toes very long and slender, fifth extending slightly beyond the first; scales on upper surface of tibia very unequal; scaling generally not quite so rough as in some females from Mariannhill.

Plumtree, ♂. Head-scales very strongly keeled, having a decidedly granular appearance; dorsal scaling as in *A. distanti*; fifth toe extending as

far as the first; ventral scales smooth; scales on upper surface of tibia very unequal.

Mazambo, ♀. Fifth toe not extending as far as the first; head as broad as long; scales on upper surface of tibia very unequal; dorsal scaling somewhat resembling *A. distanti*; toes very long and slender; ventrals strongly keeled and mucronate.

Serowe, ♀. Exactly like specimens from Mariannhill as regards scaling and head, but the fifth toe does not extend quite as far as the first.

Mozambo, ♂. Ventral scales smooth, otherwise typical.

Griffin Mine, Lydsdorp, ♂. Head much longer than broad; dorsal scaling as in those from Mariannhill; toes long and slender, fifth not reaching as far as the first; scales on upper surface of tibia very unequal; ventrals feebly keeled.

2. AGAMA ANCHIETAE.

A. *Forma typica.*

Agama, sp., Bocage, Herp. Angola, p. 21 (1895).

Agama anchietae, Bocage, Jorn. Sc. Lisb. (2) iv, 1896, p. 129.

Form.—Body moderately depressed. Head convex, as long as broad; snout very short, rounded; canthus rostralis very short; nostrils directed upwards and outwards or nearly straight upwards, in a very convex, sub-tubular shield pierced on or just above the canthus rostralis; length of head about 4 times in length to vent. Diameter of ear-opening equal to or slightly less than cleft of closed eye. Limbs moderately elongate; the hind limb, pressed against the body, reaching the neck or the ear; length of hand equal to or a little less than depth of head; fingers and toes short, not or but feebly compressed; third toe slightly longer than fourth, fifth extending as far as first or a little farther; tibia as long as head or a little longer or a little shorter, foot considerably shorter. Tail cylindrical in females, feebly compressed in males, longer ($1\frac{1}{8}$ to $1\frac{1}{3}$ times) than head and body.

Measurements (in millimetres):

	1.	2.	3.	4.	5.
From snout to vent	80	80	84	84	81
Head	20	20	22	21	20
Width of head	20	20	22	21	20
Depth of head	13	13	15	14	14
Diameter of eye-cleft	4	4	4	4	4
„ „ ear-opening	4	3.5	4	4	3.5
Fore-limb	44	42	42	42	39
Hand	13	13	13	14	13
Hind limb	57	55	56	56	51
Tibia	22	21	22	21	19
Foot	18	17	18	18	17
Tail	105	90	109	109	?

1. ♂, Maconjo, Angola. 2. ♀, Caconda, Angola (type). 3. ♀, Caconda.
4. ♀, Goas, Namaqualand (S.A. Museum). 5. ♀, Mataböhle, Namaqualand
(S.A. Museum).

Lepidosis.—Upper parts with strongly keeled scales, some of which may be mucronate, with few or moderately numerous, irregularly scattered enlarged ones, the mucronate or spinous character of which is more pronounced; lateral scales pointing towards the vertebral line; groups of spinose scales on the side of the neck and behind the ear-opening, the largest much shorter than the diameter of the latter; a low nuchal crest, continued along the back as a series of slightly enlarged, more strongly keeled scales; 90 to 100 scales round the body. Upper head-scales smooth or obtusely keeled, 10 to 14 across from one superciliary series to the other; occipital scale moderately or feebly enlarged (larger in the young); 11 to 14 upper labials on each side; 3 to 5 series of scales between the upper labials and the nasal. Gular and ventral scales more or less distinctly keeled, not or but feebly mucronate, except on the sides. Scales on upper surface of limbs equal; scale at the base of the claw, on the dorsal surface of the toes, tricarinate and much longer than the others; subdigital scales extremely spinose, the tips of the spines often dark brown or black, 13 to 16 in a longitudinal series under the third toe. Caudal scales strongly keeled, not forming whorls, subequal in size; the vertebral series forming a low serrated edge or crest.

Male with a single series of rather large preanal pores.

Coloration.—Pale yellowish or greyish brown above, uniform, or with 4 or 5 pairs of dark spots or wavy cross-bands on the body, separated by a vertebral series of pale oval or rhombic spots or by a yellow vertebral band; limbs and tail with more or less distinct dark cross-bands. Lower parts white, throat usually with wavy dark longitudinal lines; male with a central dark patch on the throat.

Habitat.—Angola and Namaqualand. The British Museum collection contains, in addition to two specimens (from Caconda and Catumbella) received from the late Prof. Barboza du Bocage, several obtained in Benguella (Caconda, Catumbella, Maconja, Huxe, Cuangu) by Dr. Ansorge. We have also examined specimens from Namaqualand (Goas, Mataböhle) in the South African Museum.

B. VAR. METHUENI, var. nov.

Agama aculeata, part., *A. atra*, part., Methuen and Hewitt, Ann. Transv. Mus. iv, 1914, p. 136.

"Four specimens [from S.W. Africa] are noteworthy owing to the fact that the dorsal crest is practically obsolete on the back; moreover, the enlarged tubercles are not numerous and arranged in an irregular fashion

such as is often met with in *A. atra*; these might be confounded with the latter species, from which they are distinct, however, in the length of the toes." (Methuen and Hewitt, *l.c.*)

We have examined these specimens (Gt. Karas Mts.) and a few others from the S. African Museum (Voigtsgrund, S.W. Africa, Namaqualand and Naroep, Namaqualand), also two in the Kimberley Museum (found between Zwart Modder and Rietfontein), and find they represent an undescribed form, which we regard as a variety of *A. anchietue*.

The shape and proportions are the same as in the typical form,* and it may suffice to mention that the hind limb reaches the ear or just behind it, that the toes are either short or moderately elongate, and that the foot is as long as or a little shorter than the tibia. Tail compressed and crested in the males, longer ($1\frac{1}{6}$ to $1\frac{1}{2}$ times) than head and body; rounded or nearly so in the females.

Scales on head, body and limbs as in the typical form,† except that the vertebral crest, which is slight on the nape, is absent on the back, and reappears on the tail, in males at least, where it forms a low serrated ridge; 90 to 105 scales round middle of body. Gular and ventral scales smooth or feebly keeled, sometimes rather strongly keeled and mucronate on the abdomen and on the sides. 14 to 17 scales in a longitudinal series under the third toe.

Dark brown above, with lighter transverse markings on the vertebral line, or reddish brown, grey or yellow, with dark brown, dark grey, or red zigzag transverse bands. A large female from Naroep is bright yellow, with small cream-coloured spots and larger orange spots, the head blackish with small light spots. Lower parts white, the head with a bluish or blackish network; belly sometimes with bluish vermiculations.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
BRITISH MUSEUM:									
Great Karas Mts. ♂ .	74	92	19	52	20	18	7	3.5	3rd
Naroep Namaland ♀ .	93	122	22	65	23	22	4	4	3rd
Namaqualand ♀ .	80	118	20	62	21	21	4	3.5	3rd
KIMBERLEY MUSEUM:									
Zwart Modder-Rietfontein ♂ . . .	86	130	22	60	22	20	4.5	3.5	3rd
Ditto ♂ . . .	87	100	22	56	21	21	5	4	3rd (R.), 4th (L.)
SOUTH AFRICAN MUSEUM:									
Voigtsgrund, Namaqualand ♂ . . .	91	115	23	62	22	20	4.5	3.5	3rd

* Some specimens show a very pronounced depression on the forehead between the eyes, but this feature has also been observed in specimens of the typical form by Bocage: "Une dépression plus marquée entre les orbites."

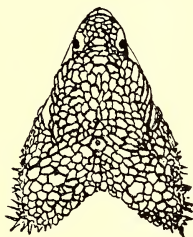
† In a male from Voigtsgrund the occipital scale is entirely absent.

TRANSVAAL MUSEUM:		1.	2.	3.	4.	5.	6.	7.	8.	9.
Great Karas Mts.	♀	.	92	107	21	55	21	18	4	3 3rd
"	♀	.	91	104	20	54	20	18	4	3 3rd
"	♀	.	87	108	21	55	20.5	19	4	4 3rd
"	♀	.	83	107	19	51	21	19	4	3.5 3rd

c. Var. *NOBELI*, var. nov.

This name is proposed for specimens from Aus in Namaqualand, which had previously been confounded with *A. atra*.

The male is readily distinguished by a very peculiar physiognomy, due to the shape of the head, which is considerably longer than broad and much



A. knobeli. Head of male.

less depressed than in *A. atra*; snout rather pointed, with the sides nearly vertical; cleft of the eye shorter than the very large ear-opening, though sometimes but very slightly. A small gular pouch is present. Body much flattened; tail very strongly compressed, fully twice, often three times, as deep as broad and tapering suddenly to a point. Limbs strong and similar to those of *A. atra*; the hind limb, stretched forward, reaches the neck or the ear; tibia longer than the head and as long as, or a little longer or a little shorter than, the foot; toes compressed distally, fifth extending a little farther than first, third and fourth equal or fourth the longer.

The scaling suggests *A. atra*, but the lateral scales point obliquely inward, as in *A. hispidula* and *A. anchietae*. Scales on the head rather large and smooth, except just behind the ear, where they are rather strongly keeled, 12 to 14 in a transverse series from one superciliary to the other; occipital very feebly enlarged; 12 to 14 upper labials; 2 or 3 series of scales between the labials and the nasal, which is convex; nostril pierced on the canthus rostralis and directed backwards in the posterior half of the nasal; very short spines near the ear. Scales on body small, 134 to 143 round the middle; dorsals smooth or keeled, some obtuse behind, others shortly mucronate, and graduating into the much smaller laterals; a few slightly

enlarged, spinose scales irregularly scattered on the back; ventral scales generally smaller than the dorsals, smooth. A feeble nuchal crest, continued on the anterior half of the body, then gradually lost, and reappearing on the tail, where it is very strongly developed. Caudal scales not forming distinct whorls, rather feebly keeled, some denticulated or mucronate. Scales on upper surface of tibia moderately large and subequal, strongly keeled.

A single series of large preanal pores; two series in one specimen.

The female could be easily mistaken for *A. atra*, with which it agrees in the shape and strong depression of the head* and in the proportions of the body and limbs; the tail is feebly or scarcely compressed and longer than head and body.

The scaling differs from that of the male in the following unimportant points: 11 scales from one superciliary to the other; 11 to 13 upper labials; scales on back and sides distinctly keeled, none enlarged; crest merely indicated on the nape, absent on the back and tail; 125 scales round middle of body.

In some of the specimens the spines on the plantar and subdigital scales are dark at the tip.

Greyish above, with the vertebral region lighter, yellowish, and faint traces of 4 or 5 darker blotches on each side of the back, which is speckled with black; the enlarged scales (male) whitish; head with dark wavy lines; a curved blackish line, or a blotch, along each side of the nape in males; upper surface of tail with dark transverse blotches. Whitish beneath, sometimes with dark bluish vermiculations, the middle of the throat blue; a wide-meshed blackish network on the head, more distinct in males, or males with the throat cobalt blue with black wavy longitudinal lines.

The following details regarding the colours in life have been supplied by Capt. J. B. Knobel, who collected the specimens, and after whom this new variety is named:

"They can change their colour like chameleons. I have killed one of various fiery-tan or terra-cotta and grey mixtures when lying on a stone, and when I took it from my pocket later it was dark blue and lighter blue. Some are dark ultramarine blue on the head and throat, Oxford blue on the chest and belly, and Cambridge blue on the flanks. At other times the whole head and body are very deep blue."

Measurements (in millimetres):

	1	2
	♂	♀
From snout to vent	126	108
Head	28	24

* More convex in one of the specimens examined, the length, width and depth being 21, 15 and 13 mm. respectively, instead of 24, 24 and 13.

	1	2
Width of head	24	24
Depth of head	18	13
Eye-cleft	5	4
Ear-opening	6	5
Fore limb	57	52
Hand	22	20
Hind limb	89	73
Tibia	32	27
Foot	32	27

1. Aus. 2. Aus, S.W.A. types.

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
KIMBERLEY MUSEUM:									
♂	126	?	28	89	32	32	5	6	4th
♂	123	127	27	72	27	27	4	5.5	4th
♂	109	146	26	72	27	27	4	4.5	3rd & 4th
♂	100	?	23	68	26	24	4	5	4th
♂	99	134	25	78	27	28	4	5	4th
♂	92	?	23	65	24	24	4	4.5	4th
♀	108	125	24	73	27	27	4	5	3rd & 4th
TRANSVAAL MUSEUM:									
♂	123	161	29	76	28	27	5	5.5	4th
♂	111	140	26	75	27	26	4.5	5	4th
S. AFRICAN MUSEUM:									
♀	94	111	20	60	22	22	4	4	4th
♀	91	?	19	63	22	23	3	3	4th

All the specimens are from Aus., Namaqualand.* The Hon. P. A. Methuen records the two Transvaal Museum specimens, referred by him to *A. atra*, as having been found at a height of 6500 ft. and 1450 ft. respectively. This is a rock or hill frequenting *Agama*, like *A. atra*. All the specimens captured by Capt. Nobel were found in rocky places, where they lived in the crevices of rocks.

3. *AGAMA ATRA*.

Agama atra, Daud. Hist. Rept. iv, p. 349 (1802); Dum. and Bibr. Erp. Gén. iv, p. 493 (1837); Bouleng. Cat. Liz. i, p. 352 (1885).

* Two of the specimens on the list, the first and last, belonging to the Kimberley Museum, are unfortunately no longer in existence; after having been sent to the senior author for study, they were lost at sea on their return to South Africa in September, 1918.

A. *Forma typica.*

Daudin's description is drawn up from two specimens stated to be in the Paris Museum.* The diagnosis is: "*Occipite spinosissimo, corpore suprâ fusco squallido sub-atro, vittâ longitudinali flavescente suprâ dorsum, abdomine gulâque cærulescentibus, caudâ sub-compressâ.*" The habitat was unknown, but Duméril and Bibron, who have fixed the definition of this species, say it is common at the Cape of Good Hope. I have therefore based the following description on specimens from the S.W. parts of South Africa, which may safely be regarded as representing *A. atra* in the sense given to it by Daudin and by Duméril and Bibron.

Form.—Head and body much depressed. Head as long as broad; snout short, rounded or obtusely pointed; canthus rostralis very short; nostril directed upwards and backwards, in a very convex, subtubular shield, pierced on the canthus rostralis; length of head $3\frac{2}{3}$ to 5 times in length to vent. Diameter of ear-opening equal to, or slightly less or slightly more than cleft of closed eye. Limbs strong, moderately elongate; the hind limb, pressed against the body, reaches the shoulder, the neck, or the ear; length of hand greater than depth of head; fingers short, third and fourth equal or fourth slightly the longer; tibia as long as the head or the foot, or a little shorter or longer; toes thick and short, third and fourth equal or fourth (very rarely third) slightly the longer, fifth extending as far as first or a little farther. Tail cylindrical in females, more or less compressed in males, longer ($1\frac{1}{10}$ to $1\frac{1}{2}$ times) than head and body.

Measurements:

	1.	2.	3.	4.
Snout to vent	82	116	93	101
Head	21	30	22	23
Width of head	21	30	22	23
Depth of head	11	16	12	14
Diameter of eye-cleft	3.5	4.5	4	4.5
„ „ ear-opening	3	4	3.5	4.5
Fore limb	43	52	44	51
Hand	16	18	15	18
Hind limb	60	80	61	74
Tibia	20	29	21	26
Foot	20	27	21	26
Tail	111	145	103	124

1. ♂, Simon's Bay. 2. ♂, Deelfontein. 3. ♀, Deelfontein. 4. ♀, Klipfontein.

Lepidosis.—Scales of upper parts very small (105 to 150 round middle of body) subequal or intermixed with few, irregularly scattered, enlarged or

* They do not seem to have been preserved, as they are not mentioned in A. Duméril's Catalogue of 1851, p. 101.

spinose scales; mid-dorsal scales larger, feebly or more or less strongly keeled, passing generally into the much smaller laterals, which are strongly keeled and mucronate, with the keels pointing outwards instead of inwards; groups of short spines on the neck and near the ear; a very feeble marked nuchal crest, but no dorsal crest whatever. Upper head-scales not very unequal, smooth or obtusely keeled; occipital feebly enlarged, exceptionally not at all; 12 to 16 scales across the head from one superciliary series to the other; 12 to 16 upper labials on each side; 2 to 4 series of scales between the upper labials and the nasal. Gular and ventral scales perfectly smooth, not mucronate. Scales on upper surface of tibia equal or subequal. Scale at the base of the claw, on the dorsal surface of the toes, uni- or tricarinate, and much longer than the others; 16 to 22 scales under the third or fourth toe, in a longitudinal series; the tips of the keels often dark brown or black. Caudal scales strongly keeled and mucronate, sometimes denticulated, the lower sometimes smooth or feebly keeled, in males often forming more or less distinct segments of 3 or 4 whorls; a more or less developed vertebral crest in males, originating some distance from the base. Scales on upper surface of tibia equal.

Male with a single row of large preanal pores.

Coloration.—Olive-grey, brown, or reddish brown above, with blackish spots or dots, or with numerous small ocellar spots with yellowish centres; sometimes a yellow or orange vertebral stripe, which may be interrupted; cheeks blue in males; throat and anterior part of belly dark blue in males, throat sometimes with a black network; sides of belly sometimes vermilion red in males; lower parts white in females, throat usually with bluish longitudinal lines or network.* In a few specimens from the Transvaal these throat lines were a bright pink and extended to the vent, forming a network on the abdomen.

In addition to the above-described strictly typical individuals, we now include under *Agama atra sensu stricto* individuals with still smaller scales (150 to 160 round middle of body), not intermixed with enlarged spinose scales, for which the name *A. micropholis* has been proposed by Matschie, Zool. Jahrb. Syst., v, 1890, p. 607, and *A. microterolepis* by Boulenger, Ann. and Mag. N.H. (6), xvii, 1896, p. 22. The types of both of these supposed species are from the Transvaal, but similar individuals occur near Kimberley along with others which show so complete a passage towards the true *A. atra* as to render the retention of *A. micropholis* even as a variety inadvisable.

Agama holubi, Bocage, Journ. Sc. Lisb. (2), iv, 1896, p. 115, from the Modder River, of which *A. pulchella*, Bocage, *l.c.*, p. 116, appears to be a

* The coloration of some breeding males is very brilliant, the back showing varying shades of pink, the sides of the body reddish brown or purple, the lower parts a glowing ultramarine blue, the tail a rich lemon yellow.

synonym, is known to us from the description only. It is described as with 170 to 180 scales round the body, with irregularly scattered, strongly keeled and mucronate ones. We regard it provisionally as a variety of *A. atra*.

We propose to distinguish, as var. *rudis*, specimens with a coarser lepidosis, of which a definition is given further on.

Particulars of Specimens Examined.

		1.	2.	3.	4.	5.	6.	7.	8.	9.
BRITISH MUSEUM:										
Simon's Bay	♂	82	111	21	60	20	20	3·5	3	3rd & 4th
"	♀	84	?	18	55	19	20	3·5	3	3rd & 4th
Prince Albert	♀	93	102	22	65	23	23	4	4	4th
Deelfontein	♂	116	145	30	80	29	27	4·5	4	3rd
"	♂	106	128	24	70	25	24	4	3·5	3rd & 4th
"	♂	91	115	24	60	22	23	4	3·5	3rd & 4th
"	♀	93	103	23	61	21	21	4	3·5	4th
"	♀	82	91	20	54	19	19	3·5	3	4th
Klipfontein	♂	80	115	20	64	22	22	3·5	3	4th
"	♀	101	124	23	74	26	26	4·5	4·5	4th
"	♀	99	122	20	75	25	25	4·5	4	4th
Kimberley	♂	105	130	25	68	25	25	4·5	4	4th
"	♂	105	?	24	67	24	25	4·5	4	4th
"	♂	102	?	21	68	23	23	4·5	3·5	3rd & 4th
"	♂	100	?	22	68	25	25	4·5	4	4th
"	♀	90	115	21	62	21	22	4	3·5	4th
"	♀	80	100	19	56	19	19	3·5	3·5	3rd & 4th
Johannesburg	♂	103	?	26	70	25	25	4	3·5	3rd
"	♂	103	?	24	68	23	23	4	4	4th
"	♀	82	91	19	53	18	18	3·5	3	3rd
Heidelberg, Transvaal	♂	108	?	24	71	24	25	4·5	4·5	3rd & 4th
Rustenburg	♂	115	160	25	76	26	26	5	5	4th
"	♀	100	?	22	65	22	22	4	4	4th
"	♀	96	125	21	68	24	24	4	3·5	4th
Types of <i>A. microderolopsis</i> .										
Naroep, Namaqualand	♂	125	?	28	84	32	28	5	5	4th
"	♀	94	120	21	68	23	23	4	4	4th
"	♀	85	112	21	66	22	23	4	4	4th
KIMBERLEY MUSEUM:										
Kalk Bay	♂	84	116	20	62	21	23	4	4	4th
Table Mountain	♂	81	?	18	50	20	20	3	3	4th
Gordon's Bay	♂	76	106	18	51	18	18	3	3	3rd & 4th
"	♂	68	98	17	50	18	19	3	3	3rd & 4th
"	♀	65	86	15	42	15	15	3	2·5	3rd & 4th
Paarl	♂	69	102	16	48	18	19	3	3	3rd & 4th
Victoria West	♀	85	?	19	51	18	19	3·5	3	4th slightly
Hanover	♂	90	?	21	63	22	22	4	3·5	4th

		1.	2.	3.	4.	5.	6.	7.	8.	9.
De Aar ♂	♀	94	?	21	61	22	21	4	4	4th
" ♂	♀	109	?	24	64	24	21	4	4	3rd & 4th
" ♀	♀	90	92	19	54	20	18	4	4	4th
" ♀	♀	92	?	19	55	20	17	4	4	3rd & 4th
Hopetown ♀	♀	101	?	21	61	21	22	3·5	3·5	4th
Fort Richmond ♂	♀	108	?	23	67	24	23	4	4	4th
Enslin ♂	♀	93	137	20	58	24	24	3·5	4	4th
" ♂	♀	104	152	23	66	26	23	4	4	3rd & 4th
" ♀	♀	98	120	21	57	22	21	4	3	3rd & 4th
" ♀	♀	88	110	18	55	21	20	4	4	4th
Kimberley ♂	♀	105	143	24	70	23	23	?	4	4th
" ♀	♀	92	116	20	59	19	21	3·5	3·5	3rd & 4th
" ♀	♀	76	101	18	49	18	17	3	3	3rd & 4th
" ♀	♀	82	?	20	51	19	19	3	3	4th
" ♀	♀	79	104	18	52	18	19	3	3·5	4th
" ♀	♀	97	105	21	59	20	21	4	4	4th
" ♂	♀	120	?	25	68	24	24	4	4	4th
" ♀	♀	93	109	19	61	22	20	3	3	3rd & 4th
" ♂	♀	100	137	21	60	22	20	3·5	4	4th
" ♂	♀	100	136	20	63	23	22	4	4	4th
" ♂	♀	101	124	21	65	23	24	4	4	4th
" ♂	♀	107	?	23	64	24	22	4	4	3rd & 4th
" ♂	♀	100	130	22	64	23	22	5	4	4th
" ♂	♀	96	?	20	62	22	23	4	4	4th
" ♂	♀	100	143	22	64	25	23	4	4	4th
" ♂	♀	99	?	22	62	23	21	4	3	4th
" ♀	♀	79	109	18	57	20	20	3	3	4th
" ♂	♀	97	132	21	63	22	21	4	4	4th
" ♂	♀	105	?	23	66	24	22	4·5	4	4th
" ♂	♀	85	119	19	54	19	22	3	4	4th
" ♀	♀	77	95	17	52	18	19	3	3	4th
" ♂	♀	98	?	21	63	22	22	5	4	4th
" ♀	♀	91	107	19	55	20	18	3	4	4th
" ♂	♀	100	136	24	65	24	24	4	4	4th
Thabanchu ♀	♀	77	90	18	50	17	17	4	3	4th
" ♂	♀	93	?	22	55	21	20	4	4	3rd & 4th
" ♂	♀	85	108	21	56	19	20	3	3	3rd & 4th
" ♀	♀	79	93	19	50	16	17	3	3	3rd & 4th
" ♂	♀	84	100	20	55	20	19	4	4	3rd & 4th
" ♂	♀	104	?	21	61	22	22	4	4	3rd & 4th
" ♂	♀	99	?	21	57	22	21	4	4·5	3rd & 4th
" ♂	♀	94	115	20	59	22	21	3·5	4	4th
" ♂	♀	90	?	20	61	22	22	4	3·5	4th
" ♀	♀	86	?	20	47	16	16	4	3	3rd & 4th
" ♀	♀	85	?	18	52	17	18	3	3	3rd & 4th
" ♂	♀	105	126	23	65	23	21	4	4	4th slightly
Bloemfontein ♂	♀	110	?	25	63	22	22	4	3·5	4th
" ♂	♀	104	142	23	62	22	23	4	4	3rd & 4th
Immigrant, O.F.S. ♂	♀	94	?	21	63	21	22	4	4	4th

		1.	2.	3.	4.	5.	6.	7.	8.	9.
Immeigrant, O.F.S.	♀	81	100	18	50	18	18	3	3	3rd & 4th
Barkly West	♀	86	96	20	50	18	18	3·5	3	3rd & 4th
"	♀	94	?	20	54	20	19	3	3·5	4th
"	♂	101	?	22	64	23	22	4	4	3rd & 4th
"	♂	95	123	20	63	22	22	4	4·5	4th
Riverton	♂	107	?	22	64	23	22	4	4	3rd & 4th
"	♀	94	?	21	55	21	20	4	3·5	4th
"	♂	105	?	22	65	24	23	4	4	4th
"	♂	108	?	23	62	23	22	4	4	4th
"	♂	106	?	23	65	23	25	3	3	4th
"	♀	90	?	18	52	19	18	3	3	4th
"	♂	88	?	19	61	22	20	3·5	3	4th
"	♂	112	?	23	68	23	23	4	3·5	3rd & 4th
"	♀	95	107	21	55	19	20	3	3	3rd & 4th
"	♂	88	119	21	60	21	22	?	3	3rd & 4th
Rooidam, Kimberley	♀	80	110	16	57	19	20	3·5	4	3rd & 4th
"	♀	76	100	18	53	18	19	3	3	3rd & 4th
"	♂	91	?	20	63	21	22	3·5	4	3rd & 4th
Taungs	♂	97	126	21	56	22	20	4	4	4th
"	♀	91	?	19	56	20	19	3·5	4	4th
"	♀	78	?	17	48	18	17	3	3	4th
Watersmeet	♀	88	93	19	52	19	16	4	4	4th
"	♂	107	?	23	64	24	21	4·5	4	4th
"	♂	90	116	20	60	21	21	3	4	3rd & 4th
"	♀	82	94	19	53	18	18	3·5	3	3rd
Otto's Hoop	♂	104	?	26	72	24	25	4	4	4th slightly
Steyensburg	♂	104	125	23	62	23	21	4·5	4	4th
ALBANY MUSEUM:										
Graaf Reinet	♂	82	?	20	53	20	21	4	4	4th
Williston	♂	122	163	25	75	28	25	4·5	4·5	4th
"	♂	96	133	22	60	23	23	4	4	4th
Victoria West	♂	102	?	24	66	24	23	4	3·5	4th
"	♀	80	91	18	54	20	18	3	3	4th
"	♂	81	?	18	51	19	19	3	3	4th
"	♀	89	?	20	58	22	20	3·5	3·5	4th
Ludlow	♂	100	?	23	61	23	20	4	4	3rd & 4th
Utlolas	♂	90	113	21	58	22	20	3	3	4th
Steinkopf	♀	85	?	20	59	22	21	3	3	4th
Kimberley	♀	79	?	18	52	20	18	3	2·5	4th
"	♀	80	92	19	49	18	17	3	3	3rd & 4th
"	♀	88	103	19	56	20	19	3	3	3rd & 4th
"	♂	98	?	23	63	22	21	3·5	3·5	4th
"	♀	78	97	18	53	19	18	3·5	3·5	3rd & 4th
"	♀	85	109	19	54	19	18	3	3	3rd & 4th
"	♂	107	?	23	67	24	23	4	4	4th
"	♂	103	131	23	62	23	22	3·5	3·5	4th
"	♂	89	125	20	63	22	23	4	4	4th
"	♂	105	?	22	68	25	22	4	4	4th

	1.	2.	3.	4.	5.	6.	7.	8.	9.
TRANSVAAL MUSEUM:									
Knysna ♀	78	85	17	49	16	18	3	3	3rd & 4th
Victoria West ♀	80	99	19	56	19	20	3·5	3·5	4th
Hanover ♀	104	?	23	66	24	22	4	4	3rd & 4th
" ♂	105	128	22	65	24	23	4	4	4th
Kimberley ♂	101	133	23	63	22	21	4	3·5	4th
" ♂	97	?	22	63	22	22	4	4	4th
" ♂	103	?	23	64	25	21	4	4	3rd & 4th
" ♂	90	110	19	58	21	20	3·5	3	4th
" ♂	108	?	22	59	21	20	4	3·5	4th
Kraikluft ♀	82	91	18	54	19	19	3	3	3rd
Narüdas Süd ♀	80	98	18	52	19	20	3	3	4th
Schweizer Reneke ♂	100	?	21	60	22	21	4	4	3rd & 4th
" ♂	100	?	20	59	22	21	4	4	3rd & 4th
" ♂	89	?	20	60	21	21	3·5	4	4th
Venterskroon ♂	92	125	19	60	22	21	3	4	4th
" ♂	93	116	20	61	22	22	3·5	4	4th
Fredrickstad ♀	80	90	17	53	19	19	3	3	4th
Orange Grove ♂	110	?	23	69	25	24	4	4	3rd & 4th
" ♀	96	107	19	59	21	21	3·5	3·5	4th
Woodbush ♂	98	136	23	68	24	24	4	4	4th
" ♂	91	120	22	65	22	22	3·5	4	4th
Rosslyn ♂	123	?	25	77	29	25	5	5	3rd & 4th
" ♂	122	159	23	77	28	25	5	5	3rd
" ♂	126	?	26	?	30	?	5	5	?
" ♂	121	146	23	75	28	25	4	5	4th
" ♀	99	114	21	61	23	20	4	4	4th
" ♀	93	106	19	61	22	22	4	4	4th
" ♀	80	100	18	56	20	20	3	4	4th
" ♀	96	?	20	59	22	21	4	4	4th
De Kroon ♂	123	?	27	78	30	26	5	5	4th
" ♀	105	?	21	65	23	20	4	4	4th
" ♂	115	?	24	74	28	25	4	4·5	3rd & 4th
" ♂	104	?	22	62	23	22	4	5	3rd & 4th
Bleskop ♂	109	152	23	72	26	24	4	4·5	3rd & 4th
" ♂	106	149	22	71	26	25	4	4·5	4th
" ♂	96	125	20	67	24	23	3·5	3·5	4th
" ♂	105	124	22	70	25	24	3·5	4	4th
" ♂	114	154	24	75	27	26	4	5	4th
" ♀	84	102	18	57	20	19	3	4	4th
" ♂	105	144	22	68	26	25	4	5	4th
" ♂	110	?	24	76	28	25	4	5	4th
" ♂	108	?	22	75	27	26	4	5	4th
" ♀	82	102	19	59	21	20	3	4	4th
" ♀	78	103	17	55	20	20	3	4	4th
" ♀	86	109	18	59	21	21	3	4	4th
" ♂	101	122	21	67	24	23	4	5	4th
De Deur Evaton, Kolkenbek ♀	78	?	17	52	19	17	3·5	3	4th slightly
Zwartkopjes ♀	86	?	19	60	21·5	20	4	4	4th

	1.	2.	3.	4.	5.	6.	7.	8.	9.
Zwartkopjes ♂	112	?	24	74	27	27	4	5	3rd & 4th
Sjaumbokstad ♀	91	114	20	63	22	22	4	4	4th
" ♂	117	?	24	76	28	26	4	4	3rd & 4th
Bonaccord Quarry ♂	112	?	21	74	27	24	4	4	4th
" ♂	103	?	22	63	25	24	4	4.5	4th
" ♀	90	96	19	59	21	20	3	3	3rd
SOUTH AFRICAN MUSEUM:									
Cape Division ♂	92	123	20	66	23	24	4	4	4th
Uitenhage ♂	108	?	24	66	25	22	4	5	4th slightly
Tulbagh ♂	105	134	23	70	26	25	3.5	4	4th slightly
Touw's River ♂	89	127	21	61	21	23	4	4	4th
Matjesfontein ♂	104	130	24	69	25	24	4	4	3rd
" ♀	91	101	21	58	20	20	4	3.5	4th slightly
Prince Albert Division ♂	115	?	21	65	24	23	4	5	4th
" ♂	91	124	22	65	23	23	4	3.5	4th
East London ♀	90	128	22	60	20	22	3.5	3	4th slightly
Nieuwoudtville ♂	94	134	20	70	25	25	4	4	4th slightly
Hanover District ♂	93	?	22	66	24	23	4	4	3rd slightly
Burghersdorp ♂	98	117	24	64	22	22	4	4	4th slightly
Smithfield ♂	85	109	20	59	19	22	4	4	4th
Springbok ♀	82	?	18	61	21	22	3	3	4th
Ookiep ♂	112	?	23	83	29	29	4	4	4th slightly
" ♂	122	?	28	83	31	29	4	5	4th slightly
" ♂	115	?	23	83	29	30	4	5	4th slightly
" ♂	85	?	19	56	20	20	4	3.5	4th
" ♂	121	166	23	80	28	28	4	4	3rd & 4th
" ♂	136	?	29	93	34	32	5	6	4th slightly
" ♂	98	126	19	68	24	24	3.5	4	4th
" ♀	91	?	20	63	22	24	3	4	4th
" ♂	121	160	24	80	30	28	4	5	4th
" ♂	101	134	22	74	26	28	4	5	4th
" ♂	124	152	26	32	29	28	4	5	4th
" ♂	92	105	20	60	22	21	4	4	3rd slightly
" ♂	129	?	28	87	32	29	4	5	3rd & 4th
" ♂	130	?	28	84	31	28	4	5	4th
" ♂	128	?	28	84	31	28	4	5	4th
" ♂	110	153	23	78	27	28	4	5	4th
" ♂	106	149	23	74	26	27	3.5	5	4th slightly
" ♂	85	119	20	58	21	20	4	4	3rd & 4th
" ♀	100	118	20	65	22	22	4	4	4th
" ♂	94	123	23	59	22	20	4	4	3rd & 4th
" ♂	115	155	23	80	28	29	4	4	4th
" ♂	118	?	25	78	29	27	4	4	4th
" ♂	95	?	23	70	24	26	3.5	4	4th slightly
" ♀	110	139	23	73	26	24	4	5	4th
" ♂	117	?	26	76	27	26	?	5	4th
Naroep ♀	97	132	22	68	25	23	4	4	3rd & 4th
Concordia ♂	116	?	24	74	27	26	4	5	4th
Port Nolloth ♂	115	146	26	78	28	28	4	5	4th

	1.	2.	3.	4.	5.	6.	7.	8.	9.
Port Nolloth ♂	117	164	27	82	29	29	4	5	4th
Oograbies ♀	100	116	21	71	25	23	4	4	4th slightly
Springbok and Steinkopf ♂	115	147	27	78	28	26	4	5	4th slightly
Steinkopf and Rymond's Drift ♀	92	110	22	60	21	20	4	4	4th
" " ♂	112	?	24	76	27	26	4	4	4th
" " ♂	117	161	25	74	26	25	4	4	4th
" " ♀	98	119	22	66	23	21	3	4	3rd slightly
" " ♂	105	?	22	80	28	27	4	5	3rd & 4th
KuBoos ♂	119	?	27	78	28	28	4	5	3rd & 4th
Kimberley ♀	92	116	20	59	22	20	3.5	3	4th
" ♂	104	?	22	67	23	23	4	4.5	4th
" ♀	77	91	17	48	17	17	3	3	4th
Krugersdorp ♂	95	?	23	64	22	23	4	4	4th
Middelburg District, C.G.H. ♂	100	?	23	64	23	21	3.5	3.5	4th

The following discrepancies between several specimens and the foregoing description were noted:

Toes rather long and slender: Table Mt. ♂, Paarl ♂, Kimberley 4 ♂, Rooidam ♂, 2 ♀, Riverton ♂, Watersmeet ♀, Narüdas Süd ♂, Bon Accord Quarry ♂, ♀.

Tail rounded: Kimberley ♂, Riverston ♂.

Little groups of spinose scales scattered here and there dorsally: Paarl ♂, Kimberley ♂, Bloemfontein ♂, Otto's Hoop ♂.

Prenal pores in two rows: Kimberley, Barkley West, Riverton, Williston, Rosslyn, Bleskop, Ookiep.

Occipital scale entirely absent: Kimberley ♂.

Adpressed hind limb reaching beyond the ear: Rooidam 2 ♀, ♂.

Head longer than broad: Knysna ♀, Narüdas Süd,

The following combinations of characters are noted:

Paarl ♂. Toes long and slender; groups of enlarged spinose scales scattered over the back.

Kimberley ♀. Toes long and slender; numerous little clusters of slightly enlarged spinose scales scattered over the back.

Kimberley ♂. Toes slender; tail rounded; no nuchal crest. Prenal pores very large. A few other males from Kimberley have unusually large preanal spores.

Kimberley ♂. Toes very short and thick on the right foot, slender on the left.

Schweizer Reneke ♂. Dorsal scaling very small, but strongly keeled, and extending for a short distance on to the tail, then suddenly meeting enlarged spinose ones; tail unusually compressed and crested.

Rosslyn ♂. Dorsal scales very small on middle of back, not keeled (132 scales round middle of body); no nuchal or dorsal crest whatever; toes short and thick, fifth extending far beyond the first.

De Kroom ♂. Scales on middle of back not imbricate, only very slightly keeled (136 scales round middle of body); no nuchal or dorsal crest.

Tulbagh ♂. Dorsal scales not imbricate, hexagonal and strongly keeled; strong nuchal and dorsal crest for some distance below the shoulders, continued along the remainder of the back by strong keels on the enlarged mid-dorsal scales; a distinct gular pouch; tail very compressed and crested.

Nieuwoudtville ♂. Dorsal scales small, strongly keeled and mucronate; double row of slightly enlarged spinose scales forming a low but distinct dorsal crest.

Ookiep ♂. Dorsal scales small, strongly keeled, rounded; becoming abruptly very much enlarged on the tail.

Ookiep ♂. Dorsal scales small, equal, those on the vertebral line smooth, the others strongly keeled and mucronate; scales on upper arm and tibia larger than the dorsals; head long and pointed.

Ookiep ♀. Dorsal scaling of this specimen somewhat approaches that of *A. planiceps*. Another ♀ and a ♂ from this locality have the general appearance of *A. planiceps*.

Ookiep ♂. Dorsal scales very small; snout pointed; mid-dorsal scales smooth, otherwise keeled; small dorsals becoming abruptly enlarged on the tail.

Concordia ♂. Scaling throughout very small; head long and pointed.

Steinkopf—Rymond's Drift ♀. Scales on and at either side of the mid-dorsal line much larger than those at the sides; all dorsal scales more or less strongly keeled but not mucronate.

In a great many cases the dorsal scales are strongly keeled but rounded at the apex, not mucronate. In other cases they are rounded or hexagonal at the base, not imbricate. Sometimes smooth except low down on the sides.

The typical *Agama atra* is distributed in the west from Damaraland to the Cape, and it is also found in the interior of Cape Colony, the Orange Free State and the Transvaal.

In the Kimberley neighbourhood this lizard is confined to the kopjes, where it makes its home in the clefts of the rocks, coming out to get food and bask in the sun. During the winter months it hibernates in these clefts, and at such times is found in company with *Zonurus polyzonus* and *Pachydactylus bibroni*.

Specimens with uniform dorsal scales might be confounded with *Agama kirkii*, Blgr., found in Southern Rhodesia, in which, however, the lateral scales are directed inwards, as in *A. hispida* and *A. anchietae*, and a vertebral serration or well-developed crest extends along the whole body; the occipital is usually more enlarged.

B. Var. RUDIS, var. nov.

Specimens from the coastal districts of South Africa, east of the Cape Peninsula and as far north as Delagoa Bay, have a coarser lepidosis, with

numerous strongly enlarged spinose scales on the back; 90 to 110 scales round middle of body; nasal shield less swollen than in the typical form. 15 to 19 scales in a longitudinal series under the third or fourth toe. Scales on upper surface of limbs sometimes very unequal in size:

Measurements, in millimetres:

	♂	♀
From snout to vent	90	85
Head	23	21
Width of head	23	21
Depth of head	14	13
Diameter of eye-cleft	4	4
„ „ ear-opening	4	3·5
Fore limb	44	40
Hand	18	16
Hind limb	63	58
Tibia	22	20
Foot	22	20
Tail	115	102

This is the common and only form at Mossel Bay, East London, and Port Elizabeth, and when series are compared with the true *Agama atra* from near Cape Town and the interior of the Cape Province the difference is very striking. Curiously, the same variety appears to exist in the Transvaal* and in the neighbouring part of Matabeleland.†

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
BRITISH MUSEUM:									
Port Elizabeth ♂	71	92	17	52	18	18	3	3	3rd & 4th
„ ♂	62	82	16	46	15	16	2·5	2·5	3rd & 4th
„ ♀	85	102	21	58	20	20	4	3·5	4th
Cape Recife ♂	86	117	21	58	20	21	4	3·5	4th
Delagoa Bay ♂	57	72	15	42	14	15	2·5	2·5	4th
Matabeleland ♂	90	115	23	63	22	22	4	4	4th
KIMBERLEY MUSEUM:									
Mossel Bay ♂	75	117	20	60	21	22	3·5	4	4th slightly
„ ♂	76	96	18	57	19	22	3·5	3	4th
„ ♀	86	110	20	55	20	22	3·5	3	4th
„ ♂	79	?	19	59	20	22	3·5	3	4th
„ ♂	85	113	20	60	22	21	3·5	3·5	3rd
„ ♀	77	117	18	54	19	20	3	3	4th slightly

* Female noticed and figured by Gough, Ann. Trans. Mus., i, 1909, p. 193, pl. xxiv, fig. 1.

† A single specimen forms part of a small collection from Matabeleland, between the Shasha and Macloostie Rivers, presented to the British Museum by Mr. Claude Beddington in 1892.

		1.	2.	3.	4.	5.	6.	7.	8.	9.	
Mossel Bay	♀	84	?	20	51	19	19	3·5	3·5		3rd & 4th
"	♂	94	?	24	63	21	23	4	4		4th
"	♀	88	101	21	60	22	21	4·5	3		4th
"	♂	76	100	?	56	21	21	3·5	3·5		4th
"	♂	94	?	24	69	25	24	4	4		4th
Oudtshoorn	♂	105	145	26	75	27	27	4	4		4th
"	♂	111	?	26	75	29	26	4·5	5		4th
East London	♀	88	121	19	56	20	21	3	3		4th
"	♀	68	99	16	50	18	19	3	2		4th
"	♂	71	106	16	49	18	21	3	3		3rd & 4th
ALBANY MUSEUM:											
Grahamstown	♂	82	104	18	54	19	19	4	3		4th
"	♀	78	96	18	45	18	18	3	3		4th
"	♂	76	107	20	55	20	20	?	3		4th
Slaai Kraal	♀	72	88	18	50	18	18	3·5	2·5		4th
Keilands	♀	77	94	18	50	19	18	3·5	3·5		4th
Cradock	♂	81	110	19	55	19	19	3·5	3·5		4th
Shawbury	♂	81	98	19	55	19	19	4	3		4th
SOUTH AFRICAN MUSEUM:											
Port Elizabeth	♂	87	116	22	59	20	21	4	3		4th
Touw's River	♀	99	123	22	64	23	23	4	4		4th
Commandofontein	♀	99	119	23	61	21	21	4	3		4th slightly
Burghersdorp	♀	83	?	19	51	18	18	4	3·5		4th slightly
TRANSVAAL MUSEUM:											
East London	♀	93	?	20	53	21	21	3	3		4th
Grahamstown	♂	96	121	23	64	23	23	4	3		4th

The following are notes on individuals which we propose to place in this variety:

Mossel Bay 2 ♂, ♀. Head only slightly depressed; enlarged spinose scales arranged in more or less zig-zag longitudinal series; adpressed hind limb reaching the eye. All the Mossel Bay specimens with more or less slender feet.

Mossel Bay ♀. Dorsal scaling mucronate throughout, and very strongly keeled; head depressed; scaling on tail uniform.

Mossel Bay ♂. Head not at all depressed, exactly as in the *A. hispida* group. A very strong nuchal crest and a slight dorsal crest for some distance below the shoulders; tail compressed laterally some distance from the vent.

East London 2 ♀, ♂. Numerous enlarged strongly keeled and mucronate scales scattered irregularly over the back; toes very slender; caudal scales in whorls.

East London ♀. Dorsal scaling not quite so coarse as in the specimens from Mossel Bay.

Commandofontein ♀. Enlarged dorsals arranged more or less in transverse rows.

Touw's River ♀. Dorsal scaling not so coarse as in specimens from Mossel Bay.

CONCLUSION.

South Africa presents many zoogeographical problems, but none is so intricate as that of the distribution of the genus *Agama*.

As regards *A. hispida*, it seems that a line drawn along the twenty-sixth meridian indicates, roughly, the limit between the ranges of the vars. *armata* (eastern) and *aculeata* (western); nowhere do these two forms overlap. At the extreme east, from the Zambesi to Natal, var. *armata* exists alone, but towards the west, from Rhodesia to the north-eastern corner of the Cape Colony, it is accompanied or replaced by var. *distanti*, which is the prevailing form in the Transvaal and the Orange Free State. In the west, from 25° lat., var. *aculeata* is accompanied by var. *brachyura*, which, from 30° lat., passes gradually into the typical *hispida* in the south—the only form occurring at the Cape.

A. anchietae and its varieties *methueni* and *knobeli* are N.W. forms.

A. atra is a more southern species, not recorded within the tropics; at the extreme S.E. of the Cape it is accompanied by var. *rudis*, which south and east of the great mountain ranges replaces the typical form, extending as far to the north as Delagoa Bay.

It was at first thought that it might be possible to co-relate the distribution of the several varieties with the various botanical regions as set forth by Dr. I. B. Pole-Evans in the Official Year Book for 1917, but when a map had been constructed for the Agamas it was found that some of the varieties, e. g. *A. aculeata*, had such a wide distribution that co-relation was impossible.

In some cases, however, distribution is restricted to comparatively small areas, and it may be possible that a systematic survey will show that these forms are confined to certain localized botanical areas. In the absence of a detailed survey it is not easy to say, and this side of the subject needs thorough investigation by reliable collectors on the spot.

Thus in regions of sandy waste there may be little oases of grass and of thorn trees, with var. *brachyura* inhabiting the former and var. *aculeata* in possession of the latter.

We have, for example, recorded var. *brachyura* from Aus and from Worcester. This at first sight seems to preclude the possibility of a regional distribution, but on reference to the above-mentioned map of the botanical regions it will be found that there is a fair-sized patch of country, just south of Worcester, indicated as being the same as the country round Aus.

We have recorded varieties *aculeata*, *distanti*, *brachyura* and *hispida* from Little Namaqualand.

Dr. L. Péringuey describes this district as follows: "From Port Nolloth